5D

Library

ME
6 13 OCT 5
C.R.

IN CONCILIO CONSILIUM

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT

of the

COUNTY ANALYST

for

THE YEAR 1954.

PRESTON:
Printed by T. Snape & Co., Ltd., Bolton's Court.
1955.

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT
of the
COUNTY ANALYST
for
THE YEAR 1954.

PRESTON:
Printed by T. Snape & Co., Ltd., Bolton's Court.
1955.

Digitized by the Internet Archive
in 2017 with funding from
Wellcome Library

https://archive.org/details/b29717991

CONTENTS

Page
Public Health and Housing Committee, 1955 ... v.
Staff of County Laboratory, 1955 ... vi.
Table 1. Total samples examined, 1954 ... 6
Table 2. Total samples examined, 1912–1954 ... 7

Part 1.

Samples taken under the Food and Drugs Acts, 1938–1950 ... 7
New Orders made in 1954 ... 8
Table 3. Samples examined under the Food and Drugs Acts during 1954 ... 13
The number of commodities examined ... 22
Total adulteration ... 22
Table 4. Percentage of adulteration of County Food and Drugs samples, 1945–1954 ... 23
Table 5. Analysis of County Food and Drugs samples ... 23
Table 6. Total adulteration. The County compared with other areas ... 24
Total adulteration.—England and Wales ... 24
Table 7. Percentage of adulteration for England and Wales, 1900–1938 ... 25
Table 8. Adulteration in the County Districts and in the areas of nine other Food and Drugs Authorities ... 26
Adulteration of milk in the County ... 30
Table 9. Percentages of adulteration of milk samples, 1945–1954 ... 30
Table 10. Milk.—Adulteration in each month of 1954 ... 31
Table 11. Analysis of milk adulteration ... 32
" Serious " and " less serious " adulteration ... 32
Table 12. List of County adulterated milk samples which were the subject of legal proceedings, 1954 ... 33
Table 13. Milk adulteration, 1954.—The County compared with other areas ... 36
Table 14. Percentage of milk adulteration for England and Wales, 1900–1938 ... 36
Milk. General ... 38
The standards of quality for milk ... 38
Channel Islands milk and South Devon milk ... 40
The average composition of milk during the year ... 40
Table 15. Average composition of milk, 1954 ... 41
The average composition of milk for each month of the year ... 41
Table 16. The average composition of morning and evening milk during the year ... 42
The average composition of milk: compared with past years ... 42
Table 17. Average composition of milk 1910–1954 ... 43
Table 18. Composition of milk, 1954. The County compared with other areas ... 44
The composition of milk. Frequencies ... 44
Table 19. Frequencies. Fat ... 45
Table 20. Frequencies. Solids-not-fat ... 46
Samples of milk taken for comparison ... 46
Appeal-to-cow samples ... 47
Table 21. Analyses of appeal-to-cow samples ... 48
Table 22. Appeal-to-cow samples.—Frequencies: fat ... 51
Table 23. Appeal-to-cow samples.—Frequencies: solids-not-fat ... 52
Milks supplied to Schools, Day Nurseries, Central Kitchens for School Meals, Children's Homes and Hostels for the Aged ... 52
Samples of milk deficient in solids-not-fat but reported as genuine 53
Adulteration of articles other than milk ... 54
Table 24, List of adulterated samples other than milk ... 54
The Labelling of Food Order ... 63
The Mineral Oil in Food Orders ... 65

Page
Cream, Artificial Cream, Synthetic Cream and Whey Cream ... 66
Ice-Cream ... 70
Table 25. Analyses of Ice-Cream Samples, 1946–1954 ... 72
Ice Lollies ... 73
Sausage, Meat Paste, Fish Paste and Meat Pies ... 74
Fresh Fruit ... 77
Soft Drinks ... 79
Gelatine ... 82
Margarine ... 83
Boric Acid Ointment ... 85
Camphorated Oil ... 86
Cod Liver Oil, Extract of Malt and Extract of Malt with Cod Liver Oil ... 86
Tincture of Iodine ... 88
Penicillin Preparations ... 89
Prosecutions ... 90
Table 26. County Fines and Costs, 1912–1954 ... 91
Table 27. List of County Districts, etc., in which prosecutions were instituted together with the results ... 92

Part II.

The Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations, 1949 to 1953 ... 93
Phosphatase Test, Half-hour Methylene Blue Test and Turbidity Test ... 94
The Milk (Special Designations) (Specified Areas) Orders, 1952 to 1954 ... 95
Table 28. Phosphatase Tests, 1954 ... 97
Table 29. Half-hour Methylene Blue Tests, 1954 ... 97
Table 30. Turbidity Tests, 1954 ... 97

Part III.

The Fertilisers and Feeding Stuffs Act, 1926 ... 98
Table 31. Composition of Fertilisers, 1954 ... 99
Table 32. Composition of Feeding Stuffs, 1954 ... 101

Part IV.

Waters, Effluents, etc. ... 103
Waters for drinking and domestic use ... 103
Table 33. Waters, 1954 ... 103
Authorities submitting water samples ... 104
Toxic Metals in Water ... 104
Table 34. Samples Examined for Lead ... 104
Other Waters, Effluents, etc. ... 105

Part V.

Miscellaneous Samples ... 105
Atmospheric Pollution Investigations ... 105
Table 35. Soot Gauge Observations.—Borough of Leigh ... 107
Table 36. Atmospheric Sulphur Determinations.—Borough of Leigh ... 107
Fig. I. Insoluble Deposit.—Borough of Leigh ... 108
Fig. II. Active Sulphur in Atmosphere.—Borough of Leigh .. 108

PUBLIC HEALTH AND HOUSING COMMITTEE
(1955)

The Chairman of the County Council :

County Alderman Sir Alfred Bates, M.C., D.L.

The Vice-Chairman of the County Council :

County Alderman A. Smith, C.B.E., J.P.

Chairman of Committee :

County Alderman Sir Thomas Tomlinson, J.P.

Vice-Chairman :

County Alderman R. H. Rowlands.

County Aldermen :

A. Guest, Esq., J.P.
C. F. Lofthouse, Esq.
H. Lord, Esq., M.B.E., J.P.
R. S. Schofield, Esq., J.P.
J. W. Thorley, Esq.
William J. Throup, Esq.
Lady Worsley-Taylor, J.P.

County Councillors :

W. Bannister, Esq.
S. J. Bargh, Esq., J.P.
C. Bethell, Esq.
H. J. Brett, Esq.
Mrs. A. G. Clayton
G. H. Dearden, Esq.
W. Forrest, Esq.
Mrs. J. Grundy
Dr. M. K. Hall
T. G. Harrison, Esq., J.P.
C. G. Mack, Esq.
H. P. Minton, Esq.
F. L. Neep, Esq.
Miss F. M. Openshaw, J.P.
G. E. Pailin, Esq., J.P.
H. A. Slater, Esq.
Fred Taylor, Esq.
Harry Turner, Esq.
T. Ward, Esq., J.P.
R. Webster, Esq.

(Three vacancies.)

LANCASHIRE COUNTY LABORATORY

STAFF 1955.

County Analyst :
G. H. Walker, Ph.D., B.Sc., F.R.I.C.

Deputy County Analyst :
A. C. Bushnell, F.R.I.C.

Senior Assistant Analyst :
R. Arnot, B.Sc., F.R.I.C.

Second Senior Assistant Analyst :
M. S. Green, B.Sc., A.R.I.C.

Assistant Analysts :
Miss C. Mayne, B.Sc., A.M.C.T., A.R.I.C.
R. E. Bridge, M.Sc.
J. L. Williams.
G. S. Meadows, A.R.I.C.
J. J. E. Sharples, B.Sc.
Miss D. Smithson, B.Sc.
G. W. Earnshaw.

Laboratory Assistants :
K. Fisher.
Miss M. Gillett.
Miss B. Bentley.

Clerical Staff :
E. L. Simpson, T.D., F.C.C.S.
H. Higginson, A.C.C.S.
Miss O. Thomas.
Miss A. Burns.

Laboratory Attendant :
Mrs. M. Hodson.

LANCASHIRE COUNTY COUNCIL

ANNUAL REPORT OF THE COUNTY ANALYST FOR THE YEAR 1954.

To the Chairman and Members of the Lancashire County Council.

I have the honour to submit for your consideration my ninth Annual Report which deals with the work carried out in the County Laboratory during the year ended 31st December, 1954. The total number of analyses and tests carried out in this period was 12,116 ; in order to facilitate reference these have been grouped under the following headings :

Part I.	Reports on Samples taken under the Food and Drugs Acts, 1938 to 1950. Page 7.
Part II.	Report on Heat-treated Milk Samples taken under the Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations, 1949 to 1953. Page 93.
Part III.	Report on Samples taken under the Fertilisers and Feeding Stuffs Act, 1926. Page 98.
Part IV.	Report on Waters, Effluents, etc. Page 103.
Part V.	Miscellaneous (including Atmospheric Pollution). Page 105.

The total number of samples from all sources examined during the year is almost as high as the corresponding figure for the year 1953 and is approximately double the number examined annually in any year prior to 1947. The number of samples examined for the County under the Food and Drugs Acts and the Fertilisers and Feeding Stuffs Act (excluding however milk samples submitted for Phosphatase, Methylene Blue or Turbidity Tests) was 8,207 and the number of Food and Drug samples submitted by the nine Autonomous Food and Drugs Authorities, for which your Analyst acts as Public Analyst, was 1,615.

The number of Food and Drugs samples submitted by the County Sampling Officers during the year 1954 was 8,089, as against 8,635 during the previous year and 8,622 in the year 1952 ; the rate of samples per 1,000 of the population was 5·93 in the year under review, 5·98 in 1953 and 5·99 in 1952. While the rate of samples per 1,000 of the population has been well maintained there has been a drop of about 550 in the total number of samples. This decrease was due to the loss of two County Districts which became Autonomous Food and Drugs Authorities during the year under review and to a temporary curtailment of samples due to the prolonged illness of three of the Sampling Officers. Nevertheless, the number of County Food and Drugs Samples has been maintained well above the level reached in 1947 (6,819). Prior to 1947, the highest figure was 5,263 in the year 1933. During the year the number of samples found to be adulterated or unsatisfactory was 417 ; this corresponds to an adulteration rate of 5·1 per cent., as against 4·5 per cent. in the year 1953, and 4·7 per cent. in the year 1952. Table 4 gives the percentage adulteration for the last 10 years and it will be seen that there has been, in general, a steady drop in this figure since the year 1944, until the year under review. Viewed in the light of the figures for the last 10 years the adulteration rate for the year, 1954, cannot be regarded as altogether unsatisfactory but it is still appreciably higher than in the years immediately preceding the last war when the percentage adulteration varied from 2·6 to 4·2.

In addition to Food and Drugs samples the County Sampling Officers submitted 867 samples of milk for examination by the Phosphatase test, the half-hour Methylene Blue test or by the Turbidity test as against 826 samples submitted in the previous year. Of these, 10 failed to pass the Phosphatase test and four samples failed to pass the statutory Methylene Blue test, the corresponding figures for the year 1953 being four and one. In addition seven samples of raw milk were submitted for examination by the Phosphatase or Methylene Blue tests. The number of Specified Areas in the County in which only designated milks can be sold is continually increasing due to the making of further Milk (Special Designations) (Specified Areas) Orders, two more of which affecting the County came into operation during the year under review. As a result of this policy on the part of the Government, more and more milk sold under special designations will be consumed and it is therefore expected that the number of pasteurised and sterilised milk samples submitted for examination by the statutory tests will also show a tendency to increase.

As usual some two-thirds of the Food and Drugs samples submitted by the County Sampling Officers consisted of samples of milk. Of 5,115 milk samples 287 were found to be adulterated which represents an adulteration rate of 5·6 per cent. The corresponding figure for the year 1953 was 4·8 per cent. and for the year 1952 it was 5·1 per cent. Reference to table 9 shows that, in general, milk adulteration in the County of Lancaster has shown consistent and appreciable decreases since the year

1946, until the year under review. It is reasonable to assume that these decreases were in some measure due to the increased sampling which had occurred since the year 1946. There has, however, been a decrease in milk sampling during the year under review for the reason already mentioned and it is significant that a drop of some 700 milk samples (corresponding to a decrease in milk sampling of approximately 12 per cent.), compared with the numbers submitted during the previous three years, has coincided with an increase in the adulteration rate. The milk adulteration rate for the year 1954 being, in fact, higher than that recorded for any year since 1949, in which year it was 5·8 per cent.

The adulteration rate for samples other than milk was 4·4 per cent. and is 0·6 per cent. higher than that obtained in the year 1953 when the figure was 3·8 per cent. The adulteration rate for the last eight years has varied from 2·8 to 4·5 per cent., the former figure in the year 1950 and the latter in the year 1951. The number of unsatisfactory sausage samples and samples whose labels did not conform with the requirements of the Labelling of Food Order is still relatively high. An examination, however, of table 24 and the sections of the report concerned with the commodities just mentioned will bring to light the fact that many of the samples reported as unsatisfactory showed only slight irregularities in composition or minor infringements of labelling requirements.

During the year 1954, the Food and Drugs Amendment Act received the Royal Assent but, except for Section 28 (which deals with private slaughterhouses), it had not come into operation at the time of writing in May, 1955. In addition, a number of new Regulations affecting the composition of food have been made during the year under review and a list of the more important of these is given on page 8. Mention should be made of the Food Standards (Margarine) Order, 1954, which not only prescribes Statutory Standards for the vitamin A and vitamin D content of margarine, but also prescribes the method by which the vitamin A is to be determined. As a result of the making of this Order the vitamin A content of margarine has been raised to that of butter. The wartime relaxation of the Preservatives Regulations in respect of margarine was revoked during the year 1954 and margarine is now no longer permitted to contain boron preservative. The Mineral Oil in Food (Amendment) Order, 1954, which came into operation on the 8th August, 1954, extends the exemptions from the Order to include citrus fruits which contain not more than 0·1 part by weight of mineral oil. Mention should also be made of an important announcement by the Minister of Food on the 21st December, 1954, in answer to a Parliamentary question, in which he stated that the addition of agene to flour is to be completely prohibited after the 31st December, 1955.

The Ministry of Food also issued three Circular Letters during the year, which are of particular interest to Public Analysts. The first drew attention to the possibility of oranges containing the toxic chemical thiourea, due to its use by certain growers to prevent stem-rot and mould growth ; the second refers to an alteration in the Code of Practice for Canned Soups ; the third deals with the meat content and the price of sausages. These, together with three reports of the Food Standards Committee of the Ministry of Food which are concerned with metallic contamination in foods and the use of antioxidants, are discussed on pages 10 to 13.

It will be remembered that in the report for the year 1953, attention was drawn to the unsatisfactory manner in which a number of orange drinks, sold diluted ready for consumption in one-third pint bottles, had been labelled. Reference to the section of this report which deals with Soft Drinks will show that there has been no appreciable improvement in the labelling of these products during the year 1954. In two instances where diluted orange drinks were labelled and sold as orange juice, successful legal proceedings were instituted and in 12 other instances the attention of manufacturers was drawn to the requirements of the Labelling of Food Order. In view of this unsatisfactory position, your Committee in October of the year under review resolved to refer the matter to the County Councils Association.

In addition to Food and Drugs samples and other samples discussed in parts I to IV of the report, mention is made on pages 109 to 114 of a number of miscellaneous samples which may be found of interest. These include investigations in connection with atmospheric pollution, the examination of canned foreign shrimps which contained prohibited preservatives, fish contaminated with phenolic substances, meat examined for the presence of horse flesh, and determinations of the amounts of extraneous water in samples of first-run milk from a pasteurising plant.

The year under review has seen the work of the County Laboratory made still more complex by the making of new food standards and by the increasing use of chemicals in the production and storage of foods. During the year the number of Autonomous Food and Drugs Authorities for which your Analyst acts as Public Analyst has also been increased from seven to nine. These changes have placed added burdens on all members of the staff and it is only due to their loyal support that the large volume of work recorded in this report has been successfully accomplished. Our duties are made no easier by the fact that when changes in technical staff occur it is found very difficult to replace them by experienced personnel. As already mentioned the year has been a difficult one for the County Sampling Officers; nevertheless, they have contributed in no small measure by their ready co-operation to the smooth running of the laboratory.

In conclusion, I wish to tender to the members of the County Council and to the County Medical Officer of Health, my most grateful thanks for their continued encouragement and support.

I have the honour to be, Mr. Chairman, Ladies and Gentlemen,

Your obedient Servant,

GEO. H. WALKER,
County Analyst.

The County Laboratory,
County Hall,
Preston,
27th May, 1955.

TOTAL SAMPLES EXAMINED.

During the year 1954, a total of 12,116 analyses and tests have been carried out in the County Laboratory. They are classified in the following table :—

Table I.

County Samples—		
Food and Drugs Acts (including 5,115 milks)		8,089
Appeal-to-Cow		67
Fertilisers and Feeding Stuffs Act, 1926 ...		51
Food and Drugs Acts samples (including three Appeal-to-Cow) from the following autonomous Food and Drugs Authorities—		
Borough of Chorley	117	
Borough of Darwen	90	
City of Lancaster	161	
Borough of Leigh	180	
Borough of Middleton	89	
Borough of Morecambe and Heysham ...	165	
County Borough of Preston	657	
Urban District of Huyton-with-Roby ...	94	
Urban District of Newton-le-Willows ...	62	
		1,615
Fertilisers and Feeding Stuffs Act, 1926 (Preston County Borough)		11
Other samples (from all sources including the County)—		
Potable Waters		76
Other Waters and Effluents		8
Miscellaneous		250
Milk Samples—Phosphatase Tests		927
Milk Samples—Methylene Blue Tests ...		919
Milk Samples—Turbidity Tests		103
Total number examined ...		12,116

The total number of samples analysed in the year is compared with the total numbers similarly classified for the previous years 1912–1953, in table 2. It will be seen from the table that, since the year 1912, the grand total of samples examined amounts to 254,953.

Table 2.

Total number of Samples examined during the years 1912 to 1954.

Year.	County Food and Drugs.	Other Authorities Food and Drugs.	County Appeal-to-cow Samples.	Other Authorities Appeal-to-cow Samples.	Fertilisers and Feeding Stuffs Act.	Waters and Effluents.	Miscellaneous and Departmental.	Total Phosphatase, Methylene Blue and Turbidity Tests	Total.
1912–1942	145992	1154	2008	25	654	2152	2740	...	154725
1943	2058	326	6	5	24	24	22	...	2465
1944	1816	540	2	4	28	35	15	...	2440
1945	1731	292	3	16	17	58	8	...	2125
1946	4122	576	107	8	29	51	36	67	4996
1947	6819	962	110	13	34	48	35	1062	9083
1948	6958	783	59	13	31	46	88	1052	9030
1949	7700	1060	53	10	52	77	98	1425	10475
1950	8104	1040	38	1	58	113	149	1595	11098
1951	8501	1337	28	9	54	196	203	1602	11930
1952	8622	1418	40	12	53	126	208	1745	12224
1953	8635	1345	50	11	59	112	237	1797	12246
1954	8089	1612	67	3	62	84	250	1949	12116
1912–1954	219147	12445	2571	130	1155	3122	4089	12294	254953

PART 1.—SAMPLES TAKEN UNDER THE FOOD AND DRUGS ACTS, 1938 TO 1950.

The Food and Drugs Act, 1938, which is the principal Act concerned with Food and Drugs legislation, came into operation on the 1st October, 1939. Many of its provisions are still in force although some have been amended, directly or indirectly by the Pharmacy and Medicines Act, 1941, the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950 (which came into operation on the 1st January, 1951), and by the long list of food regulations made by the Minister of Food during and subsequent to the war. Further changes in legislation will be brought into operation as the result of the passing of the Food and Drugs Amendment Act, 1954.

It is usual in these reports to draw attention to any new Acts or Regulations made during the year under review which have special bearing on the work of the public analyst. The following list contains the more important of these :—

The Food and Drugs Amendment Act, 1954.
The Food Standards (Margarine) Order, 1954.
The Mineral Oil in Food (Amendment) Order, 1954.
The Food Standards (Soft Drinks) (Amendment) Order, 1954.

The Act is discussed in the following paragraphs but reference to the three Orders is made in the sections of this report which deal with the commodities concerned. Later in this part of the report reference is also made to three circular letters from the Ministry of Food to Food and Drugs Authorities and to three reports of the Food Standards Committee of the Ministry of Food, all of which were published during the year under review. Finally, mention should be made of an important announcement made by the Ministry of Food on the 21st December of the year under review, in answer to a Parliamentary question, in which he stated that the addition of agene to flour is to be completely prohibited after 31st December, 1955.

The Food and Drugs Amendment Act received the Royal Assent on the 25th November, 1954 ; except for Section 28 (which deals with private slaughterhouses) ; it had not come into operation, however at the time of writing to enable a consolidation Measure and Food Hygiene Regulations to be made and all come into force at the same time. Most of the changes brought about by the new Act have already been described in discussing the Bill on pages 9 to 13 of the report for the year 1953. It is only proposed now to refer to certain additional amendments of interest to Public Analysts introduced during the passage of the Bill through Parliament.

Section 2 (3) of the new Act includes a clause that the defence under Section 4 of the 1938 Act " that the article supplied was a proprietary medicine and was supplied in response to a demand for that medicine " now ceases to have effect. Section 3 of the new Act gives power to the Ministers to make regulations prohibiting or regulating the addition of specified substances to food or prohibiting or regulating the use of any process in the preparation of food. New clauses in this section refer to the desirability of restricting the use of substances of no nutritional value in foods and, if so provided in the regulations, food certified by a public analyst as being food to which the regulations apply may be treated under Section 10 of the 1938 Act as being unfit for human consumption. A clause has been inserted in Section 4, which relates to powers to obtain information from the owners of a business with regard to food ingredients, enabling the Ministers to ask for details of investigations into the cumulative effect of a substance on the health of a consumer. Section 11 now provides that regulations may be made requiring cream or separated milk to be subjected to a specified treatment before being sold for human consumption, prohibiting the sale for human consumption of milk obtained from cows milked at any stage on a journey to or from a dairy farm or at a slaughterhouse or knacker's yard and for prohibiting churns in use by a dairyman being used otherwise than as containers for milk. Section 12 is new and prohibits the use of the word " cream " (even if part of a composite word) for any substance resembling cream, whether sold singly or as part of another food. The only exceptions are reconstituted and imitation cream sold as such or a substance sold under a description which indicates that it is not for use as, or as a substitute for, cream. Section 13 is also new and provides for the setting up of a Food Hygiene Advisory Council to which the Ministers may refer for consideration or advice any questions relating to food which come under the Food and Drugs Acts 1938 to 1954. In particular proposed regulations with regard to labelling or food hygiene, new orders with regard to requisition of premises, and new Codes of Practice will be submitted in draft for the consideration of the Council. Section 16 now includes a clause requiring a summary of the facts as well as 14 days notice being given to the Minister before proceedings are instituted in respect of labelling offences relating to food. A certificate of the Minister will be conclusive evidence that the above requirement has been complied with. Section 20 must be read with the First Schedule, which is new, and these describe in detail the procedure which must be adopted by a Sampling Officer, or other person who purchases or takes a sample of any food, drug or substance for the purpose of analysis by a public analyst. Besides the part of the sample which is submitted to the Public Analyst and the part retained by the Sampling Officer for future comparison, the Schedule indicates how the remaining portion should be disposed of in various circumstances, *i.e.*, whether it should be given to the vendor, the occupier of the premises, the consignor, the owner or even whether it should be retained by the Sampling Officer. Section 20 also requires a Sampling Officer, in cases where a name and address in the United Kingdom is displayed on the wrapper, to notify the manufacturer or packer, within three days of the procuring of the sample, that a sample has been taken and stating where it was taken or from whom it was purchased. Section 21 also refers to sampling and analyses and sub-section (4) contains a new provision in that if the Public Analyst for any reason is unable to perform an effective analysis of a sample he shall send it to the Public Analyst for some other area. Sub-section (6) is also new and entitles any person to whom a part of the sample was given, as required by the

First Schedule, to obtain a copy of the Public Analyst's certificate on payment of a fee of one shilling. Section 25 is new and alters the time within which proceedings must be commenced. For milk samples the time remains at 28 days beginning with the date on which the sample was obtained ; for all other samples the time is now two months with the provision that the time may be extended by a certificate of the Justice of the Peace before whom the information is laid if he is satisfied, in the particular case, that it was not practicable to lay the information at an earlier date. In any event in the case of milk, proceedings shall not be instituted after 42 days beginning with the date on which the sample was obtained. Section 33 relates to interpretation and the term " analysis " has now been defined as including microbiological assay but no other form of biological assay. This is important as it will enable a Public Analyst to make determinations by micro-biological methods in addition to purely chemical methods on samples submitted to him for analysis under section 69 of the principal Act. The definition of " premises " has been extended to include in relation to dairies and dairy farms any land other than buildings. Section 36 relates to repeals, etc., but states, *inter alia*, that any order made by the Minister under Regulation 2 of the Defence (Sale of Food) Regulation, 1943, shall continue in force and extends to food and drugs authorities the duty of enforcing any such order within their area. The Third Schedule gives a list of Minor and Consequential Amendments and two new points of interest in these are ; firstly, that in warranty defences in relation to samples of milk it is now no longer necessary for the defendant to serve on the authority a notice under paragraph (2) of the Third Schedule to the Principal Act if he proves that the milk in question was a mixture of milk produced on more than one dairy farm. Secondly, that for the purposes of section 94 of the Principal Act, which deals with the protection and liability of officers acting in the execution of their duty, a Public Analyst shall be treated as being an officer of the authority whether or not he is employed whole-time. The purpose of this amendment is clearly to extend to part-time Public Analysts the protection previously afforded to whole-time Public Analysts.

In addition to new orders the Ministry of Food sent to Food and Drugs Authorities during the year three circular letters which are of particular interest to Public Analysts. The first, marked M.F. 2/54, drew attention to the possibility of oranges containing thiourea, due to the use of this chemical by certain growers. This substance is regarded as toxic and the Minister has been advised that its presence in any food would be a contravention of the Public Health (Preservatives, etc., in Food) Regulations. Further reference to thiourea is made in the section of this report dealing with fresh fruit.

The second of the circular letters, marked M.F. 3/54, draws attention to an alteration in the Code of Practice for canned soups. Paragraph 2 stated " until such time as butter fat is available no exception will be taken to the use of the description " Cream Soup," provided the soup contains not less than 3½ per cent. by weight of edible oil or fat." Butter is now becoming more freely available for manufacturing purposes and paragraph 2 of the Code of Practice has been altered to read :—

> " 2.—Cream Soups.
>
> A product described as cream soup should contain not less than 2½ per cent. by weight of butter fat ; but no exception will be taken to a product sold under this description—
>
> (*a*) which contains less than 2½ per cent. but not less than 1½ per cent. by weight of butter fat if the total fat content is not less than 3 per cent, or
>
> (*b*) which contains no butter fat or less than 1½ per cent. by weight of butter fat if the total fat content is not less than 3½ per cent."

The remaining circular letter M.F. 13/54, was concerned with the meat content and price of sausages. It gave the monthly averages for meat content and price of 2,039 samples of pork sausages and of 1,431 samples of beef sausages analysed by Public Analysts in England and Wales between March, 1953 and March, 1954 inclusive. From a consideration of these figures the Minister of Food did not feel that the reintroduction of compulsory standards would be justified at present. In order, however, to keep the question of the meat content of sausages under review the circular requested that, until further notice, quarterly returns of Public Analysts should include particulars of the meat content and price of sausage samples examined by them. The circular letter also referred to the advice the Minister had given to the trade to declare the meat content on a ticket or label and so safeguard vendors from the risk of prosecution for selling sausages containing less meat than was prescribed when prices were controlled.

In December, 1951, the Metallic Contamination Sub-Committee of the Food Standards Committee of the Ministry of Food presented a report on recommendations for limits for lead in foods. As the result of additional information obtained from trade and other representations made to the Sub-Committee, a revised report was published on the 30th July of the year under review and this last report recommended that the limits now proposed should be made the basis of Statutory Standards. It is reiterated in the revised report that lead is a cumulative poison and that the limits proposed are, therefore, the lowest readily attainable under conditions of good trade practice. Furthermore, any statutory limits prescribed should be subject to periodical review and, if possible, the limits should be reduced ; this particularly applies to beer, cider, wines, ice lollies, pectins and food colourings. The general limits of 0·2 part per million for ready-to-drink beverages and 2 parts per million for other foods recommended in the original report are confirmed in the revised report but the list of scheduled foods which cannot be brought within the general limits has been extended ; in addition, narrower limits have been suggested for certain foods where these were considered practicable. For example, the recommended limit for lead in ice-cream and ice lollies is 1 part per million and for anhydrous dextrose and dextrose monohydrate 0·5 part per million. The highest limit suggested is 50 parts per million for solid pectin, with dry food colourings next at 20 parts per million. There are approximately 20 different types of foods for which special limits of 5 or 10 parts per million have been suggested. The limit at present recommended for beer, cider, wines and certain fruit juices (including tomato juice) is 1 part per million. There are one or two apparent anomalies in that, although a general recommendation is made that for chemicals which may be used in foods the B.P. or B.P.C. lead limits should apply, yet limits have been recommended for edible gelatine and for dextrose which are appreciably less than the B.P. limits.

In February of the year under review a report of the Food Standards Committee of the Ministry of Food was published which dealt with limits for zinc in foods. The report recommends a limit of 5 parts per million for beverages ready to drink and 50 parts per million for other foods. The only exemptions being edible gelatine, for which a statutory limit of 100 parts per million has already been prescribed, and foods, such as shell fish, animal offals, etc., which naturally contain zinc in amounts greater than 50 parts per million. It is not recommended that the proposed limits need be made Statutory. Zinc, like copper, is quite different from lead in that it has a physiological function in the body and an intake of approximately 10 milligrams daily is required to balance metabolic loss. The report points out, on the other hand, that large amounts of zinc in foods of the order of 800 parts per million can act as an emetic and that violent vomiting has occurred as the result of eating foods prepared in galvanized containers. Drinking rain water, stewed fruit and other moist foods should not be stored in containers lined with zinc.

During the year 1953, a report on antioxidants was presented by the Preservatives Sub-Committee of the Food Standards Committee and a brief account of the recommendations made therein was given on pages 12 and 13 of this report for the year 1953. In August, 1954, a revised report was published as the result of representations made by trade and other interests. The amendments in the revised report have the effect of increasing the number of recommended antioxidants and altering the proportions in which they may be used. In the first report it was recommended that propyl gallate not exceeding 0·01 per cent. and butylated hydroxyanisole, not exceeding 0·02 per cent., could be added separately or together to edible oils and fats (except butter) and to essential oils. It is now recommended that propyl, or octyl, or dodecyl gallate or any mixture thereof can be added to edible oils and fats (except butter) in an amount not exceeding 0·01 per cent. or to essential oils in an amount not exceeding 0·1 per cent. For butylated hydroxyanisole the proportions recommended are 0·02 per cent. and 0·1 per cent. respectively. In edible oils and fats the suggested limit for butylated hydroxyanisole (*i.e.*, 0·02 per cent.) may be used in conjunction with 0·01 per cent. of the gallates ; in the case of essential oils, however, it is recommended that the total amount of all the added antioxidants present should not exceed 0·1 per cent.

Particulars of Samples of Food and Drugs submitted by County Sampling Officers.

In table 3 there is a list of all the articles of food and drugs which were submitted during the year 1954 from the County of Lancaster together with the number of each kind and also the number found to be adulterated.

Table 3.

Samples examined under the Food and Drugs Acts during 1954.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Almonds, Ground ...	...	17	...	17	...	...	...	...
Almond Oil ...	...	16	...	16	...	1	...	1
Arrowroot	...	25	...	25	...	...	...	...
Aspirin Tablets ...	...	15	...	15	...	...	...	...
Baby Food ...	...	4	...	4	...	1	...	1
Bacon	...	27	...	27	...	...	...	...
Baking Powder ...	...	28	...	28	...	...	...	...
Barley	...	32	...	32	...	1	...	1

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Barley Water Crystals	...	1	...	1	...	...	...	...
Beer...	...	8	...	8	...	...	...	...
Biscuits	...	1	...	1	...	...	...	...
Blanc Mange Powder ...	...	26	...	26	...	...	...	...
Borax	...	18	...	18	...	1	...	1
Boric Acid ...	...	15	...	15	...	...	...	...
Boric Acid Ointment ...	...	22	...	22	...	2	...	2
Brandy	4	...	...	4	...	...	...	...
Bread	...	28	...	28	...	...	...	...
Bread, Brown ...	...	5	...	5	...	...	...	...
Bread, Fancy (Fruit, etc.) ...	...	2	...	2	...	...	...	...
Butter	...	44	3	47	...	...	...	...
Cake Mixture, Sweetened ...	...	2	...	2	...	...	...	...
Cake Mixture, Unsweetened ...	...	1	...	1	...	...	...	...
Camphorated Oil ...	...	34	...	34	...	3	...	3
Caraway Seeds ...	...	1	...	1	...	...	...	...
Castor Oil	...	32	...	32	...	...	...	...
Cereals, Breakfast...	...	8	...	8	...	...	...	...
Cheese	...	34	...	34	...	1	...	1
Chocolate Cup and Chocolate Drinking ...	...	2	...	2	...	...	...	...
Chutney	...	1	...	1	...	...	...	...
Cinnamon, Ground	...	9	...	9	...	1	...	1
Cloves, Ground ...	...	2	...	2	...	...	...	...
Cockles, Bottled ...	...	1	...	1	...	...	...	...
Cocoa	...	26	1	27	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Coconut, Desiccated	...	2	...	2	...	...	...	...
Cod Liver Oil ...	...	9	...	9	...	...	...	...
Coffee	...	28	1	29	...	...	...	...
Coffee Extract, dry	...	1	...	1	...	...	...	...
Coffee Extract Mixture, dry ...	...	2	...	2	...	...	...	...
Coffee and Chicory Essence Liquid, Sweetened ...	...	15	...	15	...	...	...	...
Coffee and Chicory Extract, Mixture, dry	...	3	...	3	...	...	...	...
Condiment, non-brewed	...	2	...	2	...	...	...	...
Cooking Fat ...	...	51	3	54	...	...	...	...
Cornflour	...	21	...	21	...	...	...	...
Cough Medicine ...	...	7	...	7	...	...	...	...
Cream, Double ...	...	3	...	3	...	...	...	...
Cream, Sterilised ...	...	34	...	34	...	1	...	1
Cream, Synthetic Powder ...	...	3	...	3	...	...	...	...
Cream of Tartar ...	...	3	...	3	...	...	...	...
Curry Powder ...	...	8	...	8	...	1	...	1
Custard Powder ...	...	35	...	35	...	...	...	...
Dessert Powder ...	...	3	...	3	...	...	...	...
Dessert Sauce Powder ...	...	1	...	1	...	...	...	...
Dripping	...	22	...	22	...	3	...	3
Epsom Salts ...	...	34	...	34	...	...	...	...
Fish, Bottled ...	...	1	...	1	...	...	...	...
Fish Cakes	...	2	...	2	...	...	...	...
Fish Canned ...	...	38	4	42	...	...	1	1
Fish Paste ...	...	15	...	15	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Fish, Potted ...	...	1	...	1	...	...	...	...
Flavouring Essences	...	25	...	25	...	...	...	...
Flour	...	25	...	25	...	...	...	...
Flour, self-raising ...	...	36	...	36	...	...	...	...
Flour Cake, sweetened ...	...	1	...	1	...	...	...	...
Flour Confectionery (Jam Tarts, etc.)	...	62	...	62	...	1	...	1
Fruit Bottled in Syrup	...	1	...	1	...	...	...	...
Fruit Canned ...	...	28	...	28	...	...	...	...
Fruit Dried ...	...	71	1	72	...	...	...	...
Fruit, Fresh (Apples, Oranges, etc.)	...	49	...	49	...	6	...	6
Fruit Juices, Bottled ...	2	4	...	6	2	2	...	4
Fruit Juices, Canned	...	2	...	2	...	1	...	1
Gelatine	...	8	...	8	...	2	...	2
Gin	11	...	...	11	1	...	...	1
Ginger, ground ...	...	15	1	16	...	...	...	...
Glycerin	...	10	...	10	...	2	...	2
Golden Raising Powder ...	...	17	...	17	...	...	...	...
Gravy Browning	...	21	...	21	...	...	...	...
Gravy Powder ...	...	1	...	1	...	...	...	...
Gravy Salt ...	...	1	...	1	...	...	...	...
Herbs, Dried Culinary	...	34	...	34	...	4	...	4
Herbs, Culinary, Bottled (Parsley in Vinegar with Salt)	...	2	...	2	...	...	...	...
Honey	...	13	...	13	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Ice-Cream	1	51	...	52	1	4	...	5
Ice Lolly	...	21	...	21	...	3	...	3
Influenza Mixture ...	...	1	...	1	...	...	...	...
Iodine, Tincture of	...	9	...	9	...	3	...	3
Jam	...	28	1	29	...	1	...	1
Jelly, Table ...	...	27	...	27	...	1	...	1
Jelly, Table, Compound ...	...	1	...	1	...	...	...	...
Lard	...	31	1	32	...	...	1	1
Lemon Curd and Lemon Cheese ...	...	45	...	45	...	...	...	...
Macaroni, Spaghetti and similar products ...	...	2	...	2	...	...	...	...
Mace, ground	...	3	...	3	...	...	...	...
Malt Extract ...	...	5	...	5	...	...	...	...
Malt Extract with Cod Liver Oil ...	...	8	...	8	...	1	...	1
Margarine	...	84	7	91	...	1	...	1
Marmalade ...	...	3	...	3	...	...	...	...
Marzipan	...	1	...	1	...	1	...	1
Meat, Canned ...	...	30	...	30	...	...	...	...
Meat, Cooked ...	...	1	...	1	...	...	...	...
Meat Extract ...	...	3	...	3	...	...	...	...
Meat Paste ...	...	4	...	4	...	...	...	...
Meat Pies (includes three Pork and four Steak and Kidney) ...	...	37	...	37	...	...	...	...
Meat Potted ...	...	2	...	2	...	1		1
Meat Pudding, Canned	...	4	...	4	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Meringue Powder ...	...	1	...	1	...	...	...	...
Milk	2685	2041	389	5115	165	107	15	287
Milk, Channel Islands	67	21	...	88	2	...	...	2
Milk examined for dirt only ...	...	3	...	3	...	3	...	3
Milk Condensed, Full Cream, Sweetened ...	...	11	...	11	...	...		...
Milk Condensed, Full Cream, Unsweetened ...	...	8	...	8	...	...	...	...
Milk Condensed, Special Full Cream, Sweetened ...	...	4	...	4	...	...	...	...
Milk Condensed, Skimmed, Sweetened ...	...	13	...	13	...	...	...	...
Milk Skimmed and Fat Compound	...	5	...	5	...	1	...	1
Mincemeat	...	28	...	28	...	1	...	1
Mint Sauce ...	...	2	...	2	...	...	...	...
Mustard, Compound ...	...	16	...	16	...	...	...	...
Mustard, Compound Liquid	...	3	...	3	...	...	...	...
Neatsfoot Oil ...	...	1	...	1	...	...	...	...
Nutmegs, ground ...	...	5	...	5	...	...	...	...
Nutmegs, whole ...	...	1	...	1	...	...	...	...
Oatmeal	...	35	2	37	...	...	...	...
Oats, Breakfast ...	...	1	...	1	...	...	...	...
Olive Oil	...	31	...	31	...	...	...	...
Orange Curd ...	...	2	...	2	...	...	...	...

Table 3—continued.

Samples.	Number Examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Pancake and Yorkshire Pudding Mixture	...	7	...	7	...	...	...	...
Paraffin, Liquid ...	...	9	...	9	...	...	...	...
Peanut Butter ...	...	1	...	1	...	...	...	...
Penicillin Lozenges	...	2	...	2	...	...	...	...
Penicillin Tablets ...	...	7	...	7	...	2	...	2
Penicillin Ointment	...	2	...	2	...	...	...	...
Pepper, White ...	...	30	...	30	...	...	...	...
Pepper Flavoured Compound ...	...	3	...	3	...	...	...	...
Pickles	...	40	...	40	...	...	...	...
Pie Filling, Lemon Flavour	...	3	...	3	...	...	...	...
Pudding, Christmas etc.	...	28	...	28	...	1	...	1
Pudding Mixture (Sago, etc.) ...	...	4	...	4	...	...	...	...
Rice	...	13	4	17	...	...	...	...
Rice, Creamed, Sweetened, Canned	...	1	...	1	...	...	...	...
Rice, ground ...	...	6	...	6	...	...	...	...
Rum	10	...	...	10	...	...	...	...
Saccharin Tablets ...	...	22	...	22	...	...	...	...
Sago	...	33	...	33	...	11	...	11
Salad Cream ...	...	13	...	13	...	...	...	...
Salt	...	17	...	17	...	...	...	...
Sauce	...	32	...	32	...	...	...	...
Sausages, Beef ...	1	38	2	41	1	4	...	5
Sausages, Pork ...	1	40	1	42	1	13	...	14
Semolina	...	25	...	25	...	...	...	...

Table 3—continued.

Samples.	Number examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Shortbread Mixture, Sweetened ...	...	2	...	2	...	...	...	...
Shrimps, Canned ...	...	2	...	2	...	...	...	...
Shrimps, Potted ...	...	3	...	3	...	...	...	...
Slimming Tablets, Herbal	...	1	...	1	...	...	...	...
Sodium Bicarbonate ...	...	5	...	5	...	...	...	...
Soft Drinks—Concentrated ...	...	8	...	8	...	2	...	2
Soft Drinks—Mineral Waters ...	...	26	...	26	...	...	...	...
Soft Drinks—Orange Drinks ...	...	25	...	25	...	16	...	16
Soup, Canned ...	...	25	...	25	...	1	...	1
Soup, Powder ...	...	1	...	1	...	...	...	...
Spice, mixed, ground	...	23	...	23	...	...	...	...
Spice, Pickling ...	...	4	...	4	...	...	...	...
Sponge Cake and Sponge Pudding Mixture, Sweetened ...	...	39	...	39	...	2	...	2
Sponge Cake and Sponge Pudding Mixture, Unsweetened ...	...	2	...	2	...	...	...	...
Spread (Invert Sugar and Honey)	...	1	...	1	...	...	...	...
Stuffing (Sage and Onion)	...	1	...	1	...	...	...	...
Suet, Shredded ...	...	16	...	16	...	1	...	1
Sugar	...	45	...	45	...	...	...	...
Sugar, Icing (includes one Flavoured) ...	...	14	...	14	..	...	...	...

Table 3—continued.

Samples.	Number examined.				Number adulterated or otherwise giving rise to irregularity.			
	Formal.	Informal.	Private.	Total.	Formal.	Informal.	Private.	Total.
Sweets (including Chocolates) ...	...	78	...	78	...	1	...	1
Sweetmeat (Chocolate Coated Raisins)	...	1	...	1	...	...	...	...
Syrup ...	...	15	...	15	...	...	...	...
Table Creams ...	...	1	...	1	...	1	...	1
Tapioca	...	19	...	19	...	3	...	3
Tartaric Acid ...	...	1	...	1	...	...	...	...
Tea	...	73	1	74	...	...	...	...
Treacle and Molasses	...	16	...	16	...	...	...	...
Tripe	...	1	...	1	...	...	...	...
Vegetables, Canned	...	50	...	50	...	2	...	2
Vegetables, Dried (Peas, etc.) ...	...	38	6	44	...	1	...	1
Vinegar, Malt ...	...	16	...	16	...	...	...	...
Vinegar, Distilled ...	...	2	...	2	...	...	...	...
Vitamin Tablets ...	...	1	...	1	...	...	...	...
Welsh Rarebit, Bottled ...	...	1	...	1	...	...	...	...
Whisky	35	1	...	36	2	...	...	2
Wine (British Sherry, British Ruby, etc.) ...	...	4	...	4	...	1	...	1
Wine, non-alcoholic ...	...	1	...	1	...	...	...	...
Yeast Extract ...	...	1	...	1	...	...	...	...
Zinc Ointment ...	...	12	...	12	...	1	...	1
Zinc and Castor Oil Cream	...	3	...	3	...	...	...	...
Totals ...	2817	4844	428	8089	175	225	17	417

The Number of Commodities.

The variety of commodities on sale is now very large, and this is reflected in the number of different articles of which samples have been taken and submitted for analysis. One hundred and eighty-eight different commodities consisting of food and drugs were examined during the year.

In order to obtain adequate sampling of the common articles of food it is the practice to issue quarterly lists of samples which assist the sampling officers to correlate their samples one with another and at the same time ensure that each area is satisfactorily sampled in respect of any particular commodity. Due to the supply position and the desirability of allowing considerable latitude in the sampling of other articles where this may be indicated in the public interest, the variety of samples actually examined is considerably increased by the inclusion of commodities in less common demand.

Total Adulteration.

During the year under review, 8,089 samples of food and drugs were submitted for examination under the Acts, and of these 417 were reported upon adversely; the total adulteration was, therefore, 5·1 per cent. This represents an increase compared with the percentage of adulteration for the previous year (1953) when the figure was 4·5 per cent.

In table 4 the percentages of adulteration are given for the past 10 years. It will be seen that during this period the lowest figure is 4·5 which was reached during the years 1950 and 1953, and that the average figure is 5·4 per cent., so that although the percentage of adulteration for the year 1954, which is 5·1, is the highest since the year 1949, it is slightly lower than the average for the past 10 years. In general, the adulteration during and subsequent to the war is considerably greater than that found in preceding years; while the figure for the year under review cannot be regarded as unsatisfactory when compared with the average figure for the last 10 years, it is higher than the figures for the previous four years and much higher than the adulteration for the 10 years 1929–1938, which preceded the war, when the percentage adulteration varied from 2·6 to 4·2.

Table 4.

Percentage of Adulteration of County Samples of Food and Drugs, 1945–1954.

Year.	Total No. of Samples.	No. of Adulterated Samples.	Percentage of Adulteration.
1945	1,731	138	8·0
1946	4,122	315	7·6
1947	6,819	477	7·0
1948	6,958	399	5·7
1949	7,700	408	5·3
1950	8,104	363	4·5
1951	8,501	412	4·8
1952	8,622	404	4·7
1953	8,635	386	4·5
1954	8,089	417	5·1
1945–1954 ...	69,281	3,719	5·4

Analysis of County Food and Drugs Samples.

The point raised in the preceding paragraph is perhaps brought out more clearly in table 5 where the percentage of adulteration over the last 10 years is given side by side with the various types of samples and with the number of samples taken per 100,000 of the population. Reference to table 2 will show that during the war years the rate of sampling dropped very considerably, in fact for the years 1942–1945 inclusive it was less than half that for the years immediately prior to the war. The total number of samples and the number of samples per 100,000 of the population for the year under review have been well maintained at the level reached during 1947 and the figures for the last eight years are much higher than the corresponding figures for any previous year in the history of the County Laboratory.

Table 5.

Year.	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Percentage of Adulteration	8·0	7·6	7·0	5·7	5·3	4·5	4.8	4·7	4·5	5·1
Total Samples	1,731	4,122	6,819	6,958	7,700	8,104	8,501	8,622	8,635	8,089
Formal Samples	870	1,648	2,318	2,478	3,011	2,798	2,751	2,654	3,220	2,817
Informal Samples	861	2,046	3,821	3,953	4,254	4,858	5,184	5,313	4,761	4,844
Private Samples	..	428	680	527	435	448	566	655	654	428
Number of Samples per 100,000 of the population	135	321	505	504	546	566	589	599	598	593

Total Adulteration : the County compared with other Areas.

Table 6 gives the percentage of adulteration for the year 1954 for certain other Food and Drugs Authorities whose figures were available at the time of writing. I am indebted to the Public Analysts of the various districts for the information included in this table and also for the figures included in tables 13 and 18. It will be seen that the figure for the County of Lancaster, *viz.*, 5·1 per cent., is the same as the average figure for the Authorities mentioned. The range of adulteration for the areas included in the table varied from 9·5 to 2·1 per cent.

Table 6.

Total Adulteration, 1954. Various Districts.

Area.	No. of Samples.	Per cent. of Adult.	Area.	No. of Samples.	Per cent. of Adult.
Somersetshire, County	2,766	4·9	Leeds	3,251	2·9
Staffordshire, County	5,494	2·7	Leicester	2,969	7·6
Surrey County	1,504	5·2	Manchester	3,606	4·5
Worcestershire, County	4,392	9·5	Portsmouth	1,945	7.2
Birmingham	5,487	7·6	Salford	1,422	4·9
Bristol	2,750	2·6	Southampton	748	2·1

Total Adulteration : England and Wales.

It is interesting to compare the position as regards adulteration in Lancashire, which is 5·1 per cent., with the corresponding figures for years between the wars for the whole of England and Wales. In table 7 there are given the figures for a long period, 34 years, omitting the years of both wars. It will be seen that the total adulteration in Lancashire for the year under review is less than the average (6·6 per cent.) for England and Wales for the years between the wars. This is the seventh occasion since the year 1940 that the adulteration rate for the County has fallen below the average for that of England and Wales for all the years shown in the table, the first occasion being the year 1948, when the total adulteration rate was 5·7 per cent.

Table 7.

Percentage of Adulteration for England and Wales, 1900–1938.

YEAR.	MILK.			TOTAL SAMPLES.		
	Number examined.	Number adul-terated.	Per-centage of Adult.	Number examined.	Number adul-terated.	Per-centage of Adult.
*1900–1913...	569,916	62,318	10·9	1,250,686	105,076	8·4
1919	57,361	6,374	11·1	101,140	8,313	8·2
1920	62,463	5,797	9·3	111,797	7,903	7·1
1921	61,439	5,290	8·6	113,664	7,582	6·7
1922	60,274	4,624	7·7	113,860	7,106	6·2
1923	59,925	4,684	7·8	114,846	6,980	6·1
1924	62,133	4,773	7·7	118,000	6,987	5·9
1925	61,909	5,163	8·3	118,930	7,714	6·5
1926	62,507	4,625	7·4	120,617	7,044	5·8
1927	63,687	4,398	6·9	124,264	6,787	5·5
1928	67,350	5,542	8·2	129,034	7,524	5·8
1929	68,115	5,293	7·8	133,584	7,260	5·4
1930	69,311	4,581	6·6	136,515	6,496	4·8
1931	70,201	4,507	6·4	136,169	6,324	4·6
1932	72,940	5,307	7·3	137,981	7,019	5·1
1933	74,545	5,760	7·7	138,171	7,601	5·5
1934	76,930	5,506	7·2	140,583	7,451	5·3
1935	78,674	5,798	7·4	143,831	7,972	5·5
1936	80,082	5,706	7·1	146,438	7,802	5·3
1937	82,357	6,107	7·4	151,370	8,401	5·5
1938	80,025	6,141	7·7	149,073	8,433	5·7
Totals ...	1,942,144	168,294	8·7	3,830,553	253,775	6·6

* Figures for 1914–1918 and 1939–1954 inclusive, not available.

Adulteration in County Districts, etc.

There are 95 Districts shown in the Area of the County Food and Drugs Authority for the year under review. Of these, Bacup Borough became part of the County Food and Drugs area in May, 1954, and the Borough of Middleton and the Urban District of Huyton-with-Roby became their own Food and Drugs Authorities during the months of April and May respectively. Both these authorities have appointed the County Analyst as their Public Analyst and thereby increased the number of Autonomous Authorities for whom your Analyst acts from seven to nine. It should also be noted that one district (Limehurst R.D.C.) was dissolved and absorbed into other districts. The figures shown in table 8 for the four authorities mentioned above are, therefore, only in respect of the time they formed part of the County Food and Drugs Area.

Table 8 shows the number of samples taken and the number of adulterated samples in each of the 95 districts together with those relating to nine autonomous areas. An examination of the table will show that adulteration was nil in 13 of the County Districts this being the same as that for the year 1953. None of the autonomous areas showed a total freedom from adulteration.

Table 8.

Adulteration in the County Districts and in the areas of nine Autonomous Food and Drugs Authorities during the year 1954.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Abram U.D.C.	10	0	14	0	24	0
Adlington U.D.C. ...	22	0	26	4	48	4
Ashton-in-Makerfield U.D.C....	42	1	46	1	88	2
Aspull U.D.C.	18	1	14	1	32	2
Atherton U.D.C. ...	65	3	42	0	107	3
Audenshaw U.D.C. ...	55	0	14	0	69	0
Bacup Borough ...	44	1	35	1	79	2
Barrowford U.D.C. ...	17	0	8	1	25	1
Billinge and Winstanley U.D.C....	13	5	12	0	25	5

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Blackburn R.D.C. ...	55	8	17	1	72	9
Blackrod U.D.C. ...	3	0	4	0	7	0
Brierfield U.D.C. ...	24	2	14	2	38	4
Burnley R.D.C. ...	73	8	20	0	93	8
Carnforth U.D.C. ...	9	0	12	0	21	0
Chadderton U.D.C. ...	86	1	70	7	156	8
Chorley R.D.C.	144	12	44	0	188	12
Church U.D.C.	19	0	11	2	30	2
Clayton-le-Moors U.D.C.	20	0	15	0	35	0
Clitheroe Borough ...	50	1	19	1	69	2
Clitheroe R.D.C. ...	87	6	4	0	91	6
Crompton U.D.C. ...	39	10	27	2	66	12
Dalton-in-Furness U.D.C....	31	1	20	0	51	1
Denton U.D.C. ...	69	2	69	4	138	6
Droylsden U.D.C. ...	82	1	47	2	129	3
Failsworth U.D.C. ...	95	27	27	1	122	28
Farnworth Borough ...	95	12	45	4	140	16
Fleetwood Borough ...	71	1	69	2	140	3
Formby U.D.C. ...	34	1	34	2	68	3
Fulwood U.D.C. ...	31	3	46	1	77	4
Fylde R.D.C.	62	9	36	1	98	10
Garstang R.D.C. ...	106	8	33	2	139	10
Golborne U.D.C. ...	46	0	52	5	98	5
Grange U.D.C.	9	2	16	0	25	2
Great Harwood U.D.C.	42	0	16	2	58	2
Haslingden Borough ...	49	2	23	0	72	2
Haydock U.D.C. ...	43	1	17	0	60	1
Heywood Borough ...	71	6	55	2	126	8
Hindley U.D.C. ...	48	2	52	2	100	4

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Horwich U.D.C. ...	41	11	24	0	65	11
Huyton-with-Roby U.D.C. ...	58	0	50	1	108	1
Ince-in-Makerfield U.D.C.	102	12	17	1	119	13
Irlam U.D.C.	62	1	13	1	75	2
Kearsley U.D.C. ...	34	1	21	0	55	1
Kirkham U.D.C. ...	28	0	13	2	41	2
Lancaster R.D.C. ...	63	8	18	0	81	8
Lees U.D.C.	12	0	8	1	20	1
Leyland U.D.C. ...	39	4	50	2	89	6
Limehurst R.D.C. ...	10	0	9	3	19	3
Litherland U.D.C. ...	123	1	60	0	183	1
Little Lever U.D.C. ...	12	0	17	0	29	0
Littleborough U.D.C. ...	28	11	32	1	60	12
Longridge U.D.C. ...	26	10	3	0	29	10
Lunesdale R.D.C. ...	51	0	10	1	61	1
Lytham St. Annes Borough	95	1	61	2	156	3
Middleton Borough ...	24	0	21	1	45	1
Milnrow U.D.C. ...	40	3	36	3	76	6
Mossley Borough ...	28	2	24	0	52	2
Nelson Borough... ...	98	1	78	2	176	3
Ormskirk U.D.C. ...	42	0	66	2	108	2
Orrell U.D.C.	30	0	16	0	46	0
Oswaldtwistle U.D.C. ...	55	0	17	0	72	0
Padiham U.D.C. ...	32	1	22	1	54	2
Poulton-le-Fylde U.D.C.	37	5	17	0	54	5
Preesall U.D.C.	8	0	6	2	14	2
Prescot U.D.C. ...	48	0	35	1	83	1
Preston R.D.C.	144	8	87	6	231	14

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Prestwich Borough ...	102	0	74	2	176	2
Radcliffe Borough ...	59	1	90	4	149	5
Rainford U.D.C. ...	6	0	28	0	34	0
Ramsbottom U.D.C. ...	50	2	34	1	84	3
Rawtenstall Borough ...	82	2	50	0	132	2
Rishton U.D.C. ...	23	0	7	0	30	0
Royton U.D.C. ...	45	3	31	4	76	7
Skelmersdale U.D.C. ...	18	0	20	2	38	2
Standish-with-Langtree U.D.C. ...	21	3	31	1	52	4
Thornton Cleveleys U.D.C....	52	7	27	0	79	7
Tottington U.D.C. ...	27	5	12	2	39	7
Trawden U.D.C. ...	11	0	0	0	11	0
Turton U.D.C.	36	0	28	2	64	2
Tyldesley U.D.C. ...	48	0	42	1	90	1
Ulverston R.D.C. ...	123	11	30	2	153	13
Ulverston U.D.C. ...	22	2	24	2	46	4
Up Holland U.D.C. ...	20	2	20	0	40	2
Urmston U.D.C. ...	149	8	58	5	207	13
Walton-le-Dale U.D.C.	109	2	55	5	164	7
Wardle U.D.C.	18	2	9	0	27	2
Warrington R.D.C. ...	158	2	36	3	194	5
West Lancashire R.D.C.	234	7	83	5	317	12
Westhoughton U.D.C. ...	50	3	30	0	80	3
Whiston R.D.C.... ...	208	5	69	2	277	7
Whitefield U.D.C. ...	28	0	38	1	66	1
Whitworth U.D.C. ...	22	1	13	0	35	1
Wigan R.D.C.	34	0	15	0	49	0

Table 8—continued.

District.	Milk.		Other Articles.		Total.	
	Samples.	Adult.	Samples.	Adult.	Samples.	Adult.
Withnell U.D.C. ...	14	0	4	0	18	0
Worsley U.D.C. ...	97	2	60	0	157	2
Total County Districts	5115	287	2974	130	8089	417
Nine Autonomous Food and Drugs Authorities	929	36	683	72	1612	108
Total all Sources ...	6044	323	3657	202	9701	525

Adulteration of Milk in the County.

The number of milks submitted under the Food and Drugs Act during the year was 5,115, and of these 287 were reported against ; the amount of adulteration was, therefore, 5·6 per cent. This figure as will be seen from table 9, although lower than the average for the last 10 years, is the highest percentage adulteration since the year 1949.

Table 9.

Percentage of Adulteration of Milk Samples, 1945–1954.

Year.	No. of Samples.	No. of Adulterated Samples.	Percentage of Adulteration.
1945	1,096	111	10·1
1946	2,669	272	10·2
1947	4,515	393	8·7
1948	4,464	293	6·6
1949	5,157	301	5·8
1950	5,324	285	5·3
1951	5,811	291	5·0
1952	5,804	298	5·1
1953	5,872	281	4·8
1954	5,115	287	5·6
Totals ...	45,827	2,812	6·1

The Adulteration of Milk in the County for each month of the year.

In table 10 will be found the figures for the number of milk samples submitted by County Sampling Officers during each month of the year together with the number adulterated and the percentage adulteration. In general it will be noted that the percentage adulteration increases during late winter and decreases in the autumn. The increasing adulteration of milk noted during the winter and first half of the year may be due to two factors : (*a*) the poorer quality of milk towards the end of the winter enables cases of slight adulteration to be detected more readily and, (*b*) the scarcity of milk in the winter may, in some instances, be an incentive to adulteration.

Table 10.

Milk.—Monthly Adulteration, 1954.

Month.	Number of Samples.	Number Adulterated.	Percentage of Adulteration.
January ...	417	37	8·9
February ...	486	50	10·3
March	476	54	11·3
April	448	18	4·0
May	506	29	5·7
June	300	15	5·0
July	312	7	2·2
August	316	22	6·9
September ...	320	13	4·1
October	345	7	2·0
November ...	673	18	2·7
December ...	516	17	3·3
Total ...	5,115	287	5·6

In the following table will be found particulars of the various types of adulteration and the number of samples under each heading.

Table 11.

			Per cent.
Milks deficient in fat only	126	*or*	2·5
Milks containing added water only	135	*or*	2·6
Milks deficient in fat and containing added water	26	*or*	0·5
Milks containing preservatives	Nil	*or*	Nil
Milks containing colouring matter	Nil	*or*	Nil
	287	*or*	5·6
Milks containing more than 3 per cent. added water	79	*or*	1·5
Milks 10 per cent. or more deficient in fat ...	51	*or*	0·9

" Serious " and " Less Serious " Adulteration.

At first sight it may seem unjustifiable to speak of " serious " and " less serious " aspects of adulteration, for any adulteration of such an indispensable article of the diet as milk, must be regarded as serious. The figures, therefore, given in table 11 for adulteration include all samples which were found to be deficient in fat or which contained added water, irrespective of whether the deficiency or the added water was small, or great enough to justify a prosecution.

It has been the practice for some years now in these Reports, however, to attempt to distinguish between " serious " and " less serious " adulteration and since a useful purpose appears to be served by the classification it is continued this year. The general principle is to include under the term " serious," samples so grossly adulterated as to justify the institution of legal proceedings on analytical grounds and to class the rest, still adulterated, but not to so great an extent, under the term " less serious."

A study of table 11 reveals that 2·4 per cent. or less than half of the total milk adulteration may be considered " serious." This figure includes 79 samples which contained added water and 51 samples which were deficient in fat. A number of these seriously adulterated samples were taken informally and could not, therefore, be the subject of prosecutions. In several other instances corresponding appeal-to-cow samples of poor quality were submitted by the Sampling Officers. Prosecutions were recommended, however, in respect of 39 samples.

In table 12 are given details in regard to the adulterated milk samples submitted by County Sampling Officers, which were the subject of legal proceedings, together with the results of the prosecutions.

Table 12.

Milk Prosecutions, 1954.

Number of Sample.	Nature of Adulteration or Irregularity.	Observations.
N.1174	Deficient 19·4% solids-not-fat; freezing point indicated 21·4% extraneous water	Same vendor. Section 9 sub-section (1) (*c*) Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950. Costs £10 19s. 6d.
N.1183	Deficient 25·4% solids-not-fat; freezing point indicated 28·0% extraneous water	
N.1184	Deficient 24·5% solids-not-fat; freezing point indicated 28·1% extraneous water	
N.1185	Deficient 25·1% solids-not-fat; freezing point indicated 28·0% extraneous water	
N.1186	Deficient 18·7% solids-not-fat; freezing point indicated 22·8% extraneous water	
E.2076	Deficient 1·2% solids-not-fat; freezing point indicated 1·0% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £10 and £4 4s. costs. Prosecutions not instituted in respect of samples Nos. E.2076 and E.2077.
E.2077	Deficient 1·7% solids-not-fat; freezing point indicated 1·8% extraneous water	
E.2078	Deficient 10% fat and 2·5% solids-not-fat; freezing point indicated 1·5% extraneous water	
E.2079	Deficient 11·6% fat and 1·7% solids-not-fat; freezing point indicated 1·1% extraneous water	
E.2103	Deficient 13·5% solids-not-fat; freezing point indicated 8·9% extraneous water	Same vendor. Section 9 sub-section (1) (*c*) Food and Drugs (Milk, Dairies and Artificial Cream) Act 1950. Fined £14 and £5 5s. costs.
E.2104	Deficient 14·4% solids-not-fat; freezing point indicated 9·9% extraneous water	

Number of Sample.	Nature of Adulteration or Irregularity.	Observations.
E.2251	Deficient 3·5% solids-not-fat; freezing point indicated 5·0% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £7 10s. and £8 8s. costs.
E.2252	Deficient 3·1% solids-not-fat; freezing point indicated 4·5% extraneous water	
E.2253	Deficient 3·4% solids-not-fat; freezing point indicated 4·7% extraneous water	
E.2254	Deficient 3·8% solids-not-fat; freezing point indicated 5·0% extraneous water	
E.2258	Deficient 3·0% solids-not-fat; freezing point indicated 3·0% extraneous water	
E.2301	Deficient 20·3% solids-not-fat; freezing point indicated 13·3% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £5 and £5 5s. costs.
E.2302	Deficient 11·4% solids-not-fat; freezing point indicated 6·0% extraneous water	
S.1724	Deficient 3·3% fat and 16·4% solids-not-fat; freezing point indicated 14·2% extraneous water	Section 83 Food and Drugs Act, 1938. Fined £5 and £6 6s. costs.
E.2547	Deficient 9·0% solids-not-fat; freezing point indicated 7·7% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £10 and £5 5s. costs.
E.2548	Deficient 9·6% solids-not-fat; freezing point indicated 8·0% extraneous water	
E.2549	Deficient 12·1% solids-not-fat: freezing point indicated 15·9% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £60 and £9 9s. costs.
E.2550	Deficient 12·6% fat and 13·2% solids-not-fat; freezing point indicated 16·2% extraneous water	
E.2551	Deficient 12·2% solids-not-fat; freezing point indicated 14·6% extraneous water	
E.2552	Deficient 1·6% fat and 14·4% solids-not-fat; freezing point indicated 15·2% extraneous water	
N.1891	Deficient 7·1% solids-not-fat; freezing point indicated 6·1% extraneous water	Section 3 Food and Drugs Act, 1938. Fined £5 and £7 7s. costs.
E.2899	Deficient 13·7% solids-not-fat; freezing point indicated 11·4% extraneous water	Section 3 Food and Drugs Act, 1938. Fined £10 and £2 2s. costs.

Number of Sample.	Nature of Adulteration or Irregularity.	Observations.
E.3236	Deficient 5·1% solids-not-fat; freezing point indicated 3·5% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £15 and £8 8s. costs.
E.3237	Deficient 28·3% fat and 25·0% solids-not-fat; freezing point indicated 21·9% extraneous water	
E.3238	Deficient 6·6% fat and 10·0% solids-not-fat; freezing point indicated 6·4% extraneous water	
C.1737	Deficient 13·8% solids-not-fat; freezing point indicated 14·5% extraneous water	Same vendor. Section 3 Food and Drugs Act, 1938. Fined £6 15s. and £12 12s. costs.
C.1738	Deficient 3·3% fat and 6·3% solids-not-fat; freezing point indicated 6·8% extraneous water	
C.1739	Deficient 13·5% solids-not-fat; freezing point indicated 12·8% extraneous water	
C.1740	Deficient 9·1% solids-not-fat; freezing point indicated 11·7% extraneous water	
C.1741	Deficient 13·7% solids-not-fat; freezing point indicated 12·8% extraneous water	
C.1742	Deficient 1·6% fat and 3·2% solids-not-fat; freezing point indicated 8·2% extraneous water	
C.1743	Deficient 4·4% solids-not-fat; freezing point indicated 4·6% extraneous water	
C.1744	Deficient 1·1% solids-not-fat; freezing point indicated 4·6% extraneous water	
C.1745	Deficient 10·9% solids-not-fat; freezing point indicated 11·9% extraneous water	
C.1991	Deficient 7·7% solids-not-fat; freezing point indicated 11·2% extraneous water	Section 3 Food and Drugs Act, 1938. Fined £2 and £3 3s. costs.
C.2518	Deficient 11·6% solids-not-fat; freezing point indicated 11·5% extraneous water	Section 3 Food and Drugs Act, 1938. Fined £4 and £5 5s. costs.

Adulteration of Milk : the County compared with Other Areas.

In the following table the percentage of milk adulteration for the year 1954 is given for a number of districts in England whose figures were available at the time of writing. The corresponding figure for the County of Lancaster was 5·6 per cent., as against 4·8 per cent., in the year 1953 and 5·1 per cent. in the year 1952. The percentage of milk adulteration in the County for the year under review is lower than the average (6·5 per cent.) for the areas included in the table. The rate of adulteration in these districts varied from 11·2 to 2·3 per cent.

Table 13.

Milk Adulteration, 1954. Various Districts.

Area.	Number of Samples.	Per cent. of Adult.	Area.	Number of Samples.	Per cent. of Adult.
Somersetshire, County ...	1,248	5·3	Leeds	3,056	2.7
Staffordshire, County ...	4,183	2·3	Leicester	2,153	8·2
Surrey County ...	1,191	4·4	Manchester ...	1,578	7·5
Worcestershire, County ...	3,203	11·1	Portsmouth ...	796	9·9
Birmingham ...	2,812	11·2	Salford	1,121	4·8
Bristol	617	8·4	Southampton ...	263	2·7

Adulteration of Milk : England and Wales.

In table 14 there are set out the percentages of milk adulteration for the whole of England and Wales for a long period, 34 years, omitting the years of both wars, which are, unfortunately, not available. It will be seen that the figure for milk adulteration in the County, *i.e.*, 5·6 per cent. is lower than the average for the whole of England and Wales for the 34 years mentioned. In fact, in none of the years included in the table was the milk adulteration for England and Wales lower than that of the

County for the year under review. Furthermore, this is the seventh time since the year 1940 that the figure for milk adulteration has fallen below the average for England and Wales for the years included in the table, the first time being in the year 1948 when the milk adulteration was 6·6 per cent.

Table 14.

Percentage of Milk Adulteration for England and Wales, 1900–1938.

Year.	Number Examined.	Number Adulterated.	Percentage of Adulteration.
*1900–1913 ...	569,916	62,318	10·9
1919	57,361	6,374	11·1
1920	62,463	5,797	9·3
1921	61,439	5,290	8·6
1922	60,274	4,624	7·7
1923	59,925	4,684	7·8
1924	62,133	4,773	7·7
1925	61,909	5,163	8·3
1926	62,507	4,625	7·4
1927	63,687	4,398	6·9
1928	67,350	5,542	8·2
1929	68,115	5,293	7·8
1930	69,311	4,581	6·6
1931	70,201	4,507	6·4
1932	72,940	5,307	7·3
1933	74,545	5,760	7·7
1934	76,930	5,506	7·2
1935	78,674	5,798	7·4
1936	80,082	5,706	7·1
1937	82,357	6,107	7·4
1938	80,025	6,141	7·7
Totals ...	1,942,144	168,294	8·7

* Figures for 1914–1918 and 1939—1954 inclusive, not available.

MILK.

General.

As in previous years the greater proportion of the samples submitted during the year consisted of milk ; the number of samples of milk was 5,115 out of a total number of samples submitted of 8,089.

The first impression created may be that the number of samples of milk seems unduly high as compared with the number of other samples. Taking into account, however, the fact that every day's production represents a separate consignment probably delivered in bottles or churns any one of which might be adulterated and the others genuine, also the perishable nature of the commodity and the importance attached to milk as a food particularly for children, mothers and invalids, it is essential that adequate steps should be taken to ensure an unadulterated supply.

Such circumstances as these have led to the conclusion that, for the detection of adulteration and in order to safeguard the quality of daily supplies, it is advisable to take a relatively large proportion of samples of milk. In a memorandum issued by the Clerk of the Lancashire County Council, it is suggested that out of each 100 samples of food and drugs taken, about 60 should consist of milk.

The Standards of Quality for Milk.

In some countries there is a definite standard of quality required for liquid milk sold to the public ; it is then illegal to sell milk which is below that standard. In this country the law is less stringent. The present Food and Drugs Acts which were in operation during the year under review were passed in the years 1938 and 1950, but they contain no standards for milk. The position remains very much as it was before these Acts came into operation, in that the one requirement laid down by law is that milk must be sold to each purchaser in the condition in which it came from the cow. If it attains a certain limit or exceeds it, it is to be regarded as above suspicion, and if it is below that limit it only becomes suspect, and it falls to the lot of the person who sold it to establish, if he can, before the Court that nothing has been added to it, or no ingredient abstracted from it.

In furtherance of the principle outlined in the preceding paragraph, presumptive limits for the composition of milk were established after exhaustive enquiries by a Government Committee appointed by the Board of Agriculture in 1900.

The outcome of the deliberations of this Committee was the production of the Sale of Milk Regulations, 1901, which were modified as regards skimmed milk in 1912. These Regulations were reproduced, in effect unaltered, in October 1939, in the Sale of Milk Regulations, 1939, made by the Ministry of Agriculture and Fisheries. They are as follows :—

(1) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 3 per cent. of milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-fat, or the addition thereto of water.

(2) Where a sample of milk (not being milk sold as separated, or condensed, milk) contains less than 8·5 per cent of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

(3) Where a sample of separated milk (not being condensed milk) contains less than 8·7 per cent. of milk-solids other than milk-fat, it shall be presumed for the purposes of the Food and Drugs Act, 1938, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk-solids other than milk-fat, or the addition thereto of water.

It will be seen from the above Regulations that no definite standard for milk is set up by them. They say, in effect, that a suspicion that adulteration may have been practised is to be entertained if either the fat falls below 3·0 per cent. or the non-fatty solids below 8·5 per cent. The very fact that failure to attain the limits only raises a presumption that milk is adulterated, means that it is admitted that a milk may be genuine, that is, not tampered with in any way, although it does not reach the figure for fat or solids-not-fat or both.

That is one side of the picture, a milk may be genuine so far as the law is concerned, and yet contain less than 3·0 per cent. of fat and 8·5 per cent. of solids-not-fat. Many milks, in fact most milks, however, have a composition well above 3·0 per cent. of fat. For instance, the average fat content of all the milks analysed in the County during the year was 3·71 per cent. Similarly the solids-not-fat are usually above 8·5 per cent., the average for the year being 8·65 per cent. The solids-not-fat may be considerably higher than the average figure just mentioned and an appreciable amount of water could then be added without bringing the solids-not-fat below the presumptive limit. For example, if a milk contained 9·3 per cent. of solids-not-fat it would be possible to add about 8·6 per cent. of water without the milk falling below the limit of the Sale of Milk Regulations. This possibility has been anticipated and provided for by Section 9 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, which re-enacts Section 24 of the 1938 Act, under which it is an offence to add water to milk (irrespective of the composition of the resulting mixture). The Hortvet Freezing Point Test enables the analyst to detect the presence and determine the amount of extraneous water in milk even in cases where the solids-not-fat have not been reduced below 8·5 per cent.

Channel Islands Milk and South Devon Milk.

In addition to the above standards of quality, which are applicable to all milk, a special standard for butter-fat content of not less than four per cent. is prescribed in The Milk (Great Britain) Order, 1954, for " Channel Islands Milk " and a similar standard is also included in the Order in respect of " South Devon Milk." Such milk is defined (*a*) as produced by cows of the Channel Islands breeds or the South Devon breed, and (*b*) which the producer thereof sells by retail or in respect of which he receives a premium paid through the medium of a premium contract issued by The Milk Marketing Board and (*c*) which is labelled " Channel Islands Milk " or " Jersey Milk," " Guernsey Milk " or " South Devon Milk " when sold in a container. The enforcement of the above Order is the responsibility of the Ministry of Food and in cases where the fat content of Channel Islands milk or South Devon milk falls below four per cent., but not below three per cent., any proceedings would normally be instituted by the Ministry of Food. During the year, 1954, 128 samples of Channel Islands milk were examined (88 were submitted by County Sampling Officers and 40 by Autonomous Authorities). They were found upon analysis to have an average butter-fat content of 4·93 per cent., and an average solids-not-fat content of 9·17 per cent. Of the 128 samples examined 124 were satisfactory but two samples, Nos. S.2059 and S.2188, submitted by a County Sampling Officer were found to have butter-fat contents of only 3·85 and 3·75 per cent. respectively. In addition, two informal samples of Channel Islands milk submitted by Autonomous Authorities were also found to have butter-fat contents of only 3·45 and 3·65 per cent. The results of the examinations of formal samples Nos. S.2059 and S.2188 and of one of the informal samples submitted by an Autonomous Authority were brought to the notice of the Ministry of Food. A follow up sample taken in respect of the remaining informal sample submitted by an Autonomous Authority was found to be genuine.

The Average Composition of Milk during the Year.

Genuine milk has not always the same composition. There are natural variations in the amounts both of fat and solids-not-fat in milk as drawn from the cow, and therefore it becomes a matter not only of interest but also of importance and significance, to know the average values for these two constituents. This information is given for the year 1954 in table 15, where it will be seen that the average figures for fat are 3·71 per cent., for solids-not-fat 8·65 per cent., and for total solids 12·36 per cent.

It should be pointed out that the average compositions and frequencies included in this section of the Report are calculated from the results of all the samples of milk (other than Channel Islands milk) received ; that is to say, there are included all adulterated samples and further, all appeal-to-cow samples, whether they were above or below the limits for fat and solids-not-fat laid down by the Sale of Milk Regulations. The figures for average composition calculated on this basis will, therefore, tend to be somewhat lower than those for genuine milk sold in the County.

Table 15.

Average Composition of Milk, 1954.

Month.	Number of Samples.*		Fat per cent.		Solids-not-fat per cent.		Total Solids per cent.	
January ...	1,411	425	3·60	3·68	8·59	8·60	12·19	12·28
February ...		499		3·59		8·60		12·19
March		487		3·55		8·56		12·11
April	1,269	453	3·59	3·63	8·66	8·58	12·25	12·21
May		516		3·55		8·68		12·23
June		300		3·61		8·75		12·36
July	957	312	3·75	3·60	8·69	8·71	12·44	12·31
August ...		323		3·81		8·65		12·46
September ...		322		3·84		8·72		12·56
October ...	1,545	345	3·87	3·93	8·68	8·71	12·55	12·64
November ...		677		3·91		8·69		12·60
December ...		523		3·76		8·66		12·42
Whole year ...	5,182		3·71		8·65		12·36	

* Includes Appeal-to-Cow samples.

The Average Compsoition of Milk for each Month of the Year.

Table 15 also includes the figures for the averages of fat and solids-not-fat for each month of the year. As regards fat it will be seen that March and May have the lowest figure, 3·55 per cent., and October the highest, 3·93 per cent. In respect of solids-not-fat, the lowest figure was obtained in March, 8·56 per cent., the highest in June, the figure then being 8·75 per cent. These variations, particularly in respect of fat content, have been the general experience for many years, the fat content usually being at its lowest in the spring and at its highest in the autumn. Solids-not-fat tend to be lower in the early months of the year.

The Average Composition of Morning and Evening Milk during the Year.

Usually, when samples are submitted, the information is given whether they are morning or evening milks. It has, therefore, been possible to classify them so as to show the average composition of morning and evening milks separately.

When cows are milked at the usual intervals the evening milk, due to the shorter interval, is richer in fat than the morning milk, while there is little if any difference as a rule in solids-not-fat. This is illustrated in table 16 below, where the average fat for morning milk is 3·60 per cent., and the evening fat 3·95 per cent. ; the fat in the evening milk being greater by 0·35 per cent., while the averages for solids-not-fat are almost identical for the morning and evening milk.

Table 16.

The Average Composition of Morning and Evening Milk during the Year.

	Number of Samples.*	Fat per cent.	Solids-not-fat per cent.	Total solids per cent.
Morning Milk...	1,229	3·60	8·61	12·21
Evening Milk	792	3·95	8·65	12·60
Mixed Milk ...	151	3·81	8·62	12·43
Unknown ...	3,010	3·68	8·67	12·35
Total ...	5,182	3·71	8·65	12·36

* Includes Appeal-to-Cow samples.

The Average Composition of Milk : compared with past years.

In table 17 the average composition of all the milks examined is set out for the period 1910-1954. It will be seen that the average figure for fat does not vary greatly from year to year. In respect of solids-not-fat there is very little difference in the averages for the years 1910-1940. Since 1940, however, it will be noted there is an appreciable decrease in solids-not-fat, the lowest figure of 8·55 per cent. being obtained in the year 1943. The average for solids-not-fat for the year under review was 8·65 per cent. In addition to other possible causes for this decrease it should be remembered, however, that seven of the 14 years during which the average solids-not-fat have been lower than formerly were years which showed a high rate of adulteration. Since the year 1943 there has been a tendency for solids-not-fat to show an upward trend but they are still appreciably below the pre-war figures.

Table 17.

Average Composition of Milks, 1910–1954.

Year.	Number of Samples.	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
1910 to 1930 ...	56,028	3·67	8·90	12·57
1931	3,090	3·84	8·81	12·65
1932	3,205	3·77	8·85	12·62
1933	3,060	3·76	8·82	12·58
1934	3,310	3·74	8·81	12·55
1935	3,422	3·75	8·84	12·59
1936	3,098	3·73	8·88	12·61
1937	3,278	3·74	8·84	12·58
1938	3,398	3·70	8·78	12·48
1939	3,128	3·67	8·78	12·45
1940	2,144	3·70	8·79	12·49
1941	1,866	3·70	8·64	12·34
1942	1,516	3·75	8·66	12·41
1943	1,489	3·70	8·55	12·25
1944	1,197	3·69	8·57	12·26
1945	1,096	3·72	8·57	12·29
1946	2,776	3·75	8·58	12·33
1947	4,625	3·75	8·63	12·38
1948	4,523	3·67	8·64	12·31
1949	5,210	3·66	8·65	12·31
1950	5,362	3·68	8·67	12·35
1951	5,839	3·67	8·65	12·32
1952	5,844	3·67	8·68	12·35
1953	5,922	3·68	8·68	12·36
1954	5,182	3·71	8·65	12·36
1910 to 1954 ...	139,608	3·72	8·85	12·57

Composition of Milk ; the County compared with Other Areas.

In table 18 below, figures are given for the composition of milk during the year 1954 in the areas of 12 other Food and Drugs Authorities. The corresponding figures for the County of Lancaster, based upon 5,382 samples of milk, are fat 3·71 per cent., solids-not-fat 8·65 per cent., and total solids 12·36 per cent. The figure for fat compares favourably with that in other areas. In respect of solids-not-fat, however, the position is not quite so satisfactory, the Lancashire figure being 0·10 per cent. below the average (8·75 per cent.) of those included in the table.

Table 18.

Composition of Milk, 1954. Various Districts.

Area.	Number of Samples.	Fat per cent.	Solids-not-fat per cent.	Total Solids per cent.
Somersetshire County	1,315	3·86	8·84	12·70
Staffordshire, County	4,353	3·62	8·72	12·34
Surrey, County ...	1,206	3·95	8·90	12·85
Worcestershire, County	3,253	3·65	8·70	12·35
Birmingham	2,844	3·69	8·65	12·34
Bristol	549	3·76	8·80	12·56
Leeds	3,056	3·69	8·70	12·39
Leicester	2,192	3·74	8·70	12·44
Manchester	1,578	3·57	8·74	12·31
Portsmouth	804	3·89	8·73	12·62
Salford	1,139	3·61	8·71	12·32
Southampton ...	263	3·89	8·91	12·80

The Composition of Milk : Frequencies.

The 5,182 samples of milk reported upon during the year have been arranged in table 19 to show the number of samples having the same percentage of fat, or, in other words, the frequency with which each percentage of fat, differing by 0·1 per cent., occurred. The table has been shortened by placing in separate groups all samples containing less than 2·5 per cent. and above 3·9 per cent. This information is given for the whole year and for each month of the year.

This table gives different information than do figures for averages. It shows that, as in previous years, there are comparatively few samples below 3·0 per cent. It also shows how the figures from which the averages are calculated are distributed, information which is not obtainable from the figures for averages alone.

In this table, and the following one, table 20, all samples of milk are included, whether adulterated or not, and also all appeal-to-cow samples.

Table 19.

Composition of Milk: Frequencies.

FAT.

Per cent.	NUMBER OF SAMPLES.												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 2·5	0	6	4	2	2	0	0	3	0	1	1	3	22
2·5	1	2	3	0	1	0	0	0	1	0	0	2	10
2·6	2	4	6	2	0	2	1	0	2	0	0	0	19
2·7	2	8	7	2	5	2	1	2	1	0	2	1	33
2·8	4	4	9	5	7	1	1	3	1	0	3	5	43
2·9	4	9	11	3	10	5	2	3	3	2	1	2	55
3·0	7	11	14	6	20	7	2	2	3	5	2	3	82
3·1	10	18	32	15	19	9	8	5	6	2	6	4	134
3·2	8	21	16	24	24	13	4	12	6	7	10	6	151
3·3	17	31	42	24	52	21	24	10	16	5	24	13	279
3·4	38	33	42	49	81	45	39	22	15	2	25	32	423
3·5	70	85	78	103	98	51	79	27	18	6	33	56	704
3·6	106	113	87	91	66	47	64	40	28	12	49	86	789
3·7	55	55	42	41	37	32	34	52	34	21	75	93	571
3·8	21	16	20	19	25	13	18	47	60	59	111	98	507
3·9	15	18	13	9	8	8	9	14	39	97	113	39	382
4·0 and Over	65	65	61	58	61	44	26	81	89	126	222	80	978
Totals	425	499	487	453	516	300	312	323	322	345	677	523	5182

Table 20 gives the frequencies for solids-not-fat. It has already been stated that the average figure for solids-not-fat for the year was 8·65 per cent., and the bulk of the individual figures for solids-not-fat are arranged closely around the average.

Table 20.

Composition of Milk : Frequencies.

SOLIDS-NOT-FAT.

Per cent.	NUMBER OF SAMPLES.												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Under 7·8	7	5	6	9	2	0	0	8	1	0	1	1	40
7·8	0	1	2	1	2	0	0	0	1	1	2	0	10
7·9	0	4	4	1	3	1	0	1	1	0	1	0	16
8·0	0	5	6	3	2	0	0	2	0	0	3	2	23
8·1	10	10	10	10	5	0	1	2	2	1	1	2	54
8·2	7	11	21	8	8	0	1	4	4	2	6	2	74
8·3	16	24	33	18	10	2	3	9	7	6	7	5	140
8·4	16	30	46	28	14	6	7	13	11	10	24	17	222
8·5	89	76	102	98	60	16	38	39	34	32	56	83	723
8·6	135	171	115	159	131	69	76	78	46	68	193	190	1431
8·7	71	91	75	62	134	90	99	85	95	134	216	127	1279
8·8	43	29	34	31	88	66	57	44	65	62	99	52	670
8·9	20	22	22	16	28	23	16	21	31	15	44	20	278
9·0 and Over	11	20	11	9	29	27	14	17	24	14	24	22	222
Totals . .	425	499	487	453	516	300	312	323	322	345	677	523	5182

Samples of Milk taken for Comparison.

The Third Schedule of the Food and Drugs Act, 1938, contains certain provisions relating to the procuring of comparison samples of milk. Briefly, when a sample of milk is obtained from a vendor he is required to give the Sampling Officer the name and address of the person from whom he, in turn, received the milk. The vendor may also, within 60 hours of the sample being taken, serve on the Food and Drugs Authority a notice stating the name and address of the person from whom he received the milk and the time and place of delivery to himself of milk from a corresponding milking, and requesting the Authority to procure, as soon as practicable, a sample of milk from a corresponding milking in course of transit or delivery to himself. The vendor shall have no right to request such a sample if the original sample procured from him was a mixture of milk obtained from more than one person. In turn, the dairyman from whom such a sample of milk is procured in course of transit or delivery, may, within 60 hours after the sample was procured, serve on the Authority concerned a notice requesting that immediate steps be taken to procure a sample of milk from a corresponding milking of the cows. The person procuring this last sample shall be empowered to take such steps at the dairy as may be necessary to satisfy him that the sample is a fair sample of the milk of the cows when properly and fully milked.

It is the practice in the County for the Sampling Officers to take, in appropriate cases, follow-up and appeal-to-cow samples without a formal request being made by the vendor. This involves a considerable amount of work both for the Sampling Officers and the Analyst. Sometimes both types of samples are obtained and as many as six and occasionally even 12 samples may be taken in connection with one unsatisfactory sample. It is thought desirable to undertake this large amount of work to ensure that everything possible is done to establish beyond all reasonable doubt that a sample is adulterated and not of naturally poor quality and, if adulterated, to obtain information indicating where the adulteration occurred before deciding whether legal proceedings should be instituted.

Appeal-to-Cow Samples.

Appeal-to-cow samples, or, as they are sometimes called, " byre " samples, if the method of taking them is properly carried out in every detail, may be regarded in the light of a final appeal. The milking must be carefully supervised, it must be established that the same cows are milked, that it is the corresponding milking and the dairy equipment must be inspected to see that it is clean and dry. The results of analysis of samples procured in this way must be accepted as those pertaining to genuine milk. Appeal-to-cow samples serve at least two purposes. In the first place, they show, in cases where an unsatisfactory sample has been sold, the quality of the unadulterated milk given by the cows, and, secondly, extend our knowledge of the quality of the milk of different herds and of the natural variations which may occur in the composition of genuine milk.

It was with the former object in view that the practice of taking appeal-to-cow samples was instituted, *viz.*, to ascertain the composition of the milk given by the cows. It is now generally admitted that the composition of the milk from a herd of cows may occasionally fall below the limits laid down in the Sale of Milk Regulations, particularly at the morning milking. When such a milk is examined the question arises whether it is an unadulterated milk of poor quality, or a milk of normal composition which has been tampered with ; the appeal-to-cow sample is intended to help to solve this problem.

In table 21 below, there is given a list of appeal-to-cow samples, submitted by County Sampling Officers during the year 1954, and also the results of analysis. Sixty-seven such samples are included, representing 20 herds, the number of cows in the herds varying from three to 41.

In addition three appeal-to-cow samples were examined for autonomous authorities.

Table 21.

Analysis of Appeal-to-Cow Samples of Milk.

Number	Number of Cows Milked.	Approximate yield, gallons.	Morning or Evening.	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C.	Taken for comparison with number—	Observations.
501	18	4	E	4·10	8·58	—0·531	N.1174 and N.1183, N.1184, N.1185 and N.1186	
502		3	E	4·65	8·97	—0·535		
503	6	8	M	3·30	8·38	—0·540	N.1201	Low in solids-not-fat.
504	12	9		3·70	8·60	—0·539		
506	8	10		3·05	8·39	—0·540		Low in solids-not-fat.
282	13	12	E	3·95	8·35	—0·536	E.2078 and E.2079	Low in solids-not-fat.
283				3·95	8·37	—0·536		Low in solids-not-fat.
284	3	5	M	3·55	8·53	—0·543	E.2103 and E.2104	
507	15	26	M	3·00	8·00	—0·535	N.1395	Low in solids-not-fat.
508				2·35	7·87	—0·536		Poor in fat and low in solids not fat.
509				2·90	8·12	—0·534		Poor in fat and low in solids-not-fat.
510				2·35	7·99	—0·533		Poor in fat and low in solids-not-fat.
511				2·70	8·02	—0·535		Poor in fat and low in solids-not-fat.
512				2·40	7·96	—0·533		Poor in fat and low in solids-not-fat.
285	7	5	M	3·10	8·50	—0·533	E.2251 and E.2253	
410	5	10	M	2·65	8·63	—0·544	C.995, C.997, C.998, C.999 and C.1000	Poor in fat.
411	5	10		2·95	8·83	—0·544		Poor in fat.
412	5	10		2·50	8·58	—0·543		Poor in fat.
413	5	10		2·75	8·53	—0·544		Poor in fat.
414	4	10		2·30	8·16	—0·543		Poor in fat and low in solids-not-fat.
415	4	10		3·30	8·40	—0·544		Slightly low in solids-not-fat.
S.1826	5	11	M	3·13	8·33	—0·531	S.1808 to S.1814 inclusive and S.1820 to S.1825 inclusive	Low in solids-not-fat.
S.1827	4	10½		2·88	8·23	—0·531		Poor in fat and low in solids-not-fat.
S.1828	7	10¾		3·12	8·37	—0·538		Low in solids-not-fat.
S.1829	4	9½		3·18	8·45	—0·540		Slightly low in solids-not-fat.
S.1830	6	10¾		3·07	8·40	—0·533		Slightly low in solids-not-fat.
S.1831	7	10½		2·95	8·51	—0·536		Poor in fat.
S.1832	8	7		3·33	8·71	—0·533		

Table 21—continued.

Number	Number of Cows Milked.	Approximate yield, gallons.	Morning or Evening.	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C.	Taken for comparison with number—	Observations.
S.1888	10	13	M	3·15	8·25	—0·534	S.1864	Low in solids-not-fat.
S.1889	10	12		2·70	8·46	—0·536		Poor in fat and slightly low in solids-not-fat.
S.1890	10	12		3·00	8·44	—0·538		Slightly low in solids-not-fat.
S.1891	6	7		2·85	8·15	—0·539		Poor in fat and low in solids-not-fat.
286	12	8	M	3·47	8·32	—0·537	E.2548	Low in solids-not-fat.
513	18	19	M	2·25	7·85	—0·543	N.1779	Poor in fat and low in solids-not-fat.
514				2·60	7·94	—0·543		Poor in fat and low in solids-not-fat.
515				3·35	8·03	—0·547		Low in solids-not-fat.
516				2·75	8·12	—0·544		Poor in fat and low in solids-not-fat.
517	19	17	E	4·10	8·86	—0·553	N.1891	
518				4·20	8·56	—0·550		
519				3·85	8·23	—0·549		Low in solids-not-fat.
520	20	16½	E	3·00	9·06	—0·536	N.1937	
521				2·75	8·69	—0·533		Poor in fat.
522				2·85	8·73	—·0535		Poor in fat.
523				2·75	8·53	—0·536		Poor in fat.
524				2·95	8·57	—0·535		Poor in fat.
525				3·45	8·63	—·0538		
526				2·75	8·82	—0·534		Poor in fat.
288	11	8	M	3·55	8·37	—0·538	E.3236, E.3237, E.3238	Low in solids-not-fat.
289		11½		2·40	8·30	—0·539		Poor in fat and low in solids-not-fat.
290	11	18	E	6·00	8·00	—0·545	E.3236, E.3237, E.3238	Rich in fat and low in solids-not-fat.
291				3·40	8·40	—0·544		Slightly low in solids-not-fat.
416	35	35	E.	5·65	8·56	—0·537	C.1737 to C.1745 inclusive	Rich in fat.
417				5·00	8·52	—0·541		Rich in fat.
418				5·45	8·70	—0·538		Rich in fat.
351	12	16	M	2·60	8·92	—0·546	E.3401	Poor in fat.
352				2·95	8·72	—0·542		Poor in fat.
*420	9	10	M	3·35	8·09	—0·514	C.2518	Deficient 4·8 per cent. solids-not-fat; freezing point indicated 2·6 per cent. extraneous water.
421		9		3·30	8·62	—0·537		
422	9	10	M	3·65	8·65	—0·545	C.2518 and 420 and 421	
423		11		3·45	8·61	—0·545		

Table 21—continued.

Number	Number of Cows Milked.	Approximate yield, gallons.	Morning or Evening.	Fat per cent.	Solids-not-fat per cent.	Freezing Point (Hortvet) °C.	Taken for comparison with number—	Observations.
527	12	12	E	2·82	8·50	—0·543	N.2873, N.2874, N.2875, N.2876 and N.2877	Poor in fat.
528		12	E	2·85	8·67	—0·541		Poor in fat.
529		7	E	3·25	8·51	—0·541		
530		12	M	2·40	8·60	—0·541		Poor in fat.
531		12	M	2·55	8·63	—0·540		Poor in fat.
532		2½	M	4·75	8·91	—0·536		
533		2½	M	3·50	8·04	—0·540		Low in solids-not-fat.

*Appeal-to-cow sample No. 420, taken in connection with sample No. C.2518 was found to be deficient of 4·8 per cent. solids-not-fat and to contain not less than 2·6 per cent. of extraneous water on the Hortvet freezing point test. Repeat samples Nos. 422 and 423 taken on the following day under more stringent supervision, had normal freezing points.

An inspection of table 21 shows that the freezing point depression of the appeal-to-cow samples was determined in every case, and this gave valuable evidence of the authenticity of the samples. Although, as indicated in the next paragraph, a number of the appeal-to-cow samples were naturally poor in solids-not-fat, in no such instance was the freezing point of the sample above —0·530°C. (Hortvet), the figure which is usually accepted as the highest freezing point given by milk free from extraneous water. Excluding Sample No. 420 the freezing points of the 66 remaining samples varied between 0·531°C. to —0·553°C. (Hortvet) ; the average figure being —0·539°C. (Hortvet). The average freezing points of appeal-to-cow samples examined during the five preceding years were —0·540°C., —0·540°C., —0·540°C., —0·541°C. and —0·541°C. (Hortvet.)

A further examination of the results in table 21 makes it obvious that some of the samples did not attain the presumptive limits of 3·0 per cent. for fat and 8·5 per cent. for solids-not-fat laid down by the Sale of Milk Regulations, 1939. In this respect 29 samples contained less than 3·0 per cent. fat and 32 samples (excluding sample No. 420) contained less than 8·5 per cent. solids-not-fat. It must be remembered, however, that the appeal-to-cow samples listed in the above table were all taken in connection with previous samples of milk which were either adulterated or of unsatisfactory quality ; in other words, the high proportion of poor quality appeal-to-cow samples obtained is due to selective sampling and it cannot, therefore, be assumed that the results are indicative of the general quality of milk in Lancashire.

In tables 22 and 23 will be found the analytical results obtained in respect of the remaining 66 appeal-to-cow samples, after excluding Sample No. 420, submitted by County Sampling Officers arranged to show their frequencies in respect of fat content and solids-not-fat.

Table 22.

Appeal-to-cow Samples.—Frequencies.

FAT.

Per cent.	Number of Samples.	Percentage of Total Samples.
2·2	1	1·5
2·3	3	4·6
2·4	3	4·6
2·5	2	3·0
2·6	3	4·6
2·7	7	10·6
2·8	5	7·6
2·9	5	7·6
3·0	5	7·6
3·1	5	7·6
3·2	1	1·5
3·3	5	7·6
3·4	4	6·0
3·5	3	4·6
3·6	1	1·5
3·7	1	1·5
3·8	1	1·5
3·9	2	3·0
4·1	2	3·0
4·2	1	1·5
4·6	1	1·5
4·7	1	1·5
5·0	1	1·5
5·4	1	1·5
5·6	1	1·5
6·0	1	1·5
Total ...	66	100·0

Table 23.

Appeal-to-cow Samples.—Frequencies.

SOLIDS-NOT-FAT.

Per cent.	Number of Samples.	Percentage of Total Samples.
7·8	2	3·0
7·9	3	4·6
8·0	5	7·6
8·1	4	6·0
8·2	3	4·6
8·3	9	13·6
8·4	6	9 1
8·5	13	19·7
8·6	10	15·1
8·7	4	6·0
8·8	3	4·6
8·9	3	4·6
9·0	1	1·5
Total	66	100·0

Milk Supplied to Schools, Day Nurseries, Central Kitchens for School Meals, Children's Homes and Hostels for the Aged.

The 389 samples of milk marked " Private " in table 3 were taken from consignments delivered to Schools, Day Nurseries, a Central Kitchen for School Meals, Children's Homes and Hostels for the Aged in the County. Fifteen of these samples were adulterated, corresponding to an adulteration rate of 3·8 per cent. This figure is considerably lower than the total milk adulteration rate for the County, which was 5·6 per cent. Viewed in this light, the results cannot be regarded as unsatisfactory.

Of the 389 samples, 327 were taken at Schools. Fourteen of these were found to be adulterated or otherwise unsatisfactory. Repeat samples were taken and on examination found to be satisfactory. Twenty-seven samples were taken at Day Nurseries and, of these, one was found to be adulterated. A follow-up sample taken in respect of this latter sample was found to be genuine. In addition, one sample of milk was taken at a Central Kitchen for School Meals ; 13 samples at Children's Homes and 21 at Hostels for the Aged, all of which were found to be satisfactory.

Samples of Milk deficient in solids-not-fat but genuine.

Attention has already been drawn, in the sections of this Report dealing with the " Standards of quality for milk " and " appeal-to-cow " samples, to the fact that milk as it comes from the cow is not always of such quality as to comply with the minimum presumptive limits of 3·0 per cent. for milk-fat and 8·5 per cent. for solids-not-fat, of the Sale of Milk Regulations, 1939. In order to decide whether such samples submitted under the Food and Drugs Act were in fact as given by the cow, and therefore, genuine, it is still necessary in the case of presumed fat deficiencies to make an actual comparison with an " appeal-to-cow " sample from a corresponding milking. Formerly, this was also the only means by which it could be decided whether a sample low in solids-not-fat was of naturally poor quality or whether it had been adulterated by the addition of water. For the past 25 years or so, however, it has been possible by submitting the sample to the Hortvet freezing point test for the Analyst to obtain additional evidence that a deficiency in solids-not-fat was due to the presence of extraneous water or, alternatively, that it was due to natural causes.

In the section of the revised Ministry of Health memorandum 36/Foods (1939), dealing with Public Analysts' quarterly reports, it is laid down that in the case of samples below the presumptive limits of the Sale of Milk Regulations, the report should show whether they were adjudged genuine by the Analyst on other grounds. It is now the normal procedure to submit all samples low in solids-not-fat to the Hortvet freezing point test and to include in the quarterly reports a table giving details of such samples which satisfactorily pass the test.

During the year under review, 349 samples of milk were found to be poor in solids-not-fat, but were adjudged genuine by the Hortvet freezing point test. This figure corresponds to 6·7 per cent. of the total milk samples (including appeal-to-cow) submitted by County Sampling Officers. These poor quality milks were distributed over the year as follows :—165 in the March quarter, 84 in the June quarter, 44 in the September quarter and 56 in the December quarter. The samples were not, therefore, confined to any particular season of the year, although the greatest number was obtained towards the end of the winter and the lowest towards the end of summer. The lowest figure for solids-not-fat shown by any of these samples was 7·70 per cent., the next lowest being 7·75 per cent.

Each year it is usual to find an appreciable number of milk samples which are poor in solids-not-fat but are nevertheless adjudged genuine as the result of applying the Hortvet freezing point test. The number of such samples, *viz.*, 6·7 per cent., submitted during the year under review is higher by 2·4 per cent. than for the year 1953, when the figure was 4·3 per cent. In the five years preceding the year 1953 the percentage of milk samples coming under this heading varied from 3·8 to 7·9 per cent.

Adulteration of Articles other than Milk.

During the year under review there were examined for the County 2,974 samples other than milk ; of these 130 were reported against, which corresponds to an adulteration rate of 4·4 per cent., which is higher than the figure obtained in the year 1953, when it was 3·8 per cent. The percentage of adulteration in articles other than milk for the year under review, as is usual, was lower than that for milk, *viz.*, 5·6 per cent. An examination of tables 3 and 24 shows that the numbers of unsatisfactory sausage samples and samples whose labels did not conform with the requirements of the Labelling of Food Order still remain relatively high.

Table 24 gives a list of the articles other than milk submitted by County Sampling Officers which were found to be unsatisfactory with particulars of the type of adulteration and the action taken.

Table 24.

Samples, other than Milk, Adulterated or otherwise giving rise to Irregularity.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.2041 ..	Pure Orange Drink ..	Informal	No name of the food except the words " pure orange drink "	Packers agreed to alter label.
C.697 ..	Dried Peas ..	Informal	Sample contained 28 per cent. of dried beans and mouse excreta present	Remainder of stock examined and found satisfactory.
N.1215 ..	Morning Fruit Drink ..	Informal	No name of the food except the words " Morning Fruit Drink "	Manufacturers interviewed
N.1266 ..	Pork Sausages ..	Informal	Meat content only 53·5 per cent.	Vendor interviewed.
S.1518 ..	Orange Drink ..	Informal	No name of the food except the words " Orange Drink "	Manufacturers agreed to use correct labels.
S.1528 ..	Dried Marjoram ..	Informal	Sand and other siliceous matter 6·2 per cent. *i.e.* an excess of 1·7 per cent.	Packers undertook to take steps to avoid a recurrence of this in the future.
N.1296 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.2094 ..	Afternoon Tea Cakes Mixture, Sweetened ..	Informal	Contained 160 parts per million benzoic acid contrary to Preservative Regulations	Ingredients now being used do not contain Benzoic Acid.
N.1319 ..	Pork Sausages ..	Informal	Meat content 59 per cent.	Vendor interviewed.
S.1550 ..	Whole Orange Juice ..	Informal	Contained only 7 per cent. whole orange	See No. S.1582.
E.2122 ..	Pork Sausages ..	Informal	Meat content 56·5 per cent.	Vendor interviewed.
S.1582 ..	Whole Orange Juice ..	Formal	Consisted of a Soft Drink containing only 7 per cent. whole orange	Defence Sale of Food Regulations, 1943 1(1). Fined £5 and £4 4s. costs.
E.2123 ..	Sponge Cake and Sponge Pudding Mixture, Sweetened ..	Informal	Available carbon dioxide only 0·09 per cent.	No further stock available
E.2192 ..	Dripping ..	Informal	Free Fatty Acids (as oleic acid) 11·7 per cent. Should not contain more than 1·5 per cent. free fatty acid	Stock surrendered.
N.1364 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
C.911 ..	Camphorated Oil	Informal	Contained 18·5 per cent. camphor. B.P. limits 19—21 per cent.	Manufacturers undertook that in future their product would comply with official standards.
N.1385 ..	Boric Acid Ointment ..	Informal	Contained 9·4 per cent. Boric Acid. Consisted of Ointment of Boric Acid B.P. 1932	Old stock. No further stock left.
E.2215 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
C.921 ..	Sardines ..	Private (Day Nursery)	Tin 300 parts per million	Further sample genuine.
E.2246 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
C.956 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
S.1671 ..	Pork Sausages ..	Informal	Meat content 62·5 per cent.	No action advised.
E.2276 ..	Table Jelly ..	Informal	Total Sugar (calculated in accordance with the Food Standards (Table Jellies) Order) 60·5 per cent.	No action advised.
C.1039 ..	Tapioca ..	Informal	Consisted of Sago	Vendor interviewed.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
S.1740 ..	Pork Sausages ..	Informal	Meat under 64 per cent.	No action advised.
E.2391 ..	Gin ..	Formal	35·2° Under Proof contained 0·3 per cent. excess water	No action advised.
N.1552 ..	Gelatine ..	Informal	3 per cent. solution did not set at 60°F.	See number N.1658.
S.1780 ..	Apples ..	Informal	Contained lead 3·0 parts per million and Arsenic (as As) 1·9 parts per million. Recommended maximum limits: Lead 2 parts per million and Arsenic (as As) 1 part per million	Importers, Port Health Authority and Minister of Food notified.
E.2432 ..	Apples ..	Informal	Contained Lead 3·0 parts per million and Arsenic (as As) 1·2 parts per million. Recommended maximum limits: Lead 2 parts per million and Arsenic (as As) 1 part per million	Importers, Port Health Authority and Ministry of Food notified.
E.2433 ..	Oranges ..	Informal	Juice from Oranges contained 12 parts per million Thioures	Importers, Port Health Authority and Ministry of Food notified.
C.1180 ..	Sago ..	Informal	Consisted of Tapioca containing a trace of Sago	Vendor interviewed.
N.1658 ..	Gelatine ..	Informal	3 per cent. solution did not set when kept at 60°F.	Remainder of stock destroyed.
S.1880 ..	Ground Cinnamon ..	Informal	Contained 4·3 per cent. sand and other siliceous matter	Stock withdrawn from sale.
E.2459 ..	Beef Sausages ..	Formal	Meat content 46 per cent.	Manufacturers interviewed.
E.25[illegible]0 ..	Mixed Sweet Herbs ..	Informal	No declaration of ingredients on label	Sale stopped until printing on label corrected.
E.2506 ..	Fresh Orange Drink ..	Informal	Sample contained only 3·5 per cent. Orange Juice	Packers communicated with. Referred to Ministry of Food.
E.2507 ..	Morning Orange ..	Informal	Sample contained two pieces of wood weighing 0·1 gram. and unsatisfactory label	Packers cautioned.
E.2518 ..	Lard ..	Private (Day Nursery)	Consisted of Cooking Fat	Supplied as Lard in error.
C.1226 ..	Table Creams ..	Informal	Consisted of a Table Jelly compound as defined in the Food Standards (Table Jellies) Order, 1949. The Labelling of Food Order requires the common or usual name (as above) of the food to be specified on the label	Label approved by Ministry of Food.

Table 24—continued.

No. of. Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.1724 ..	Beef Sausages ..	Informal	Meat content only 47 per cent.	Manufacturer gave assurance that he would increase meat content.
N.1725 ..	Whole Orange Drink ..	Informal	Name and address of firm on cap not decipherable	Packers agreed to have name and address clearly printed on the bottle.
E.2536 ..	Orange Juice Canned ..	Informal	Tin 550 parts per million and and lacquer stripped off interior of can	Remainder of stock surrendered.
E.2561 ..	Concentrated Chicken Broth, Canned	Informal	Meat protein in soup made according to directions only 0·6 per cent. Code of Practice for Canned Soups (Meat Broth) requires 1 per cent protein in finished product	Stock withdrawn from sale.
E.2616 ..	Potted Meat ..	Informal	Contained 5·7 per cent. starch and 72·5 per cent. moisture. Potted meat should contain no starch and not more than 70 per cent. moisture	Sold as Potted Meat in error. Vendor undertook to change the name of this commodity to Meat Paste.
E.2653 ..	Glycerin ..	Informal	Contained 1 per cent. excess water	No action advised.
E.2659 ..	Pork Sausages ..	Informal	Meat content 55·5 per cent.	Vendor interviewed. Agreed to increase meat content.
E.2722 ..	Ice Lollies ..	Informal	No declaration of ingredients	Packers agreed to alter label.
C.1422 ..	Orange Drink ..	Informal	No name of the food on the label	Packers agreed to alter label.
S.2055 ..	Orange Juice ..	Formal	Consisted of a Soft Drink containing only 10 per cent. Orange (including juice)	Defence (Sale of Food) Regulations, 1943. Fined £4 and £5 5s. costs
S.2059 ..	Channel Islands Milk ..	Formal	Fat content only 3·85 per cent.	Ministry of Food informed.
N.1849 ..	Pork Sausages ..	Informal	Meat content 46·5 per cent.	See No. N.1950.
E.2759 ..	Pure Fruit Juice ..	Informal	Bottle incorrectly labelled—no address given. Sample did not consist of pure fruit juice but was a Soft Drink containing only 4·6 per cent. orange.	Vendor cautioned. No longer bottling this commodity.
E.27[illegible]8 ..	Apples ..	Informal	Arsenic (as As) 1·3 parts per million	Ministry of Food communicated with.
N.1950 ..	Pork Sausage ..	Formal	Deficient 32 per cent. of the minimum percentage of meat	Section 3 Food and Drugs Act, 1938. Granted conditional discharge on payment of £1 5s. costs.

Table 24—continued.

No. of. Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
N.1967 ..	Tincture of Iodine ..	Informal	Contained 0·13 per cent. excess iodine and 0·25 per cent excess potassium iodide	See No. N.2111.
N.1970 ..	Tincture of Iodine ..	Informal	Contained 0·06 per cent. excess iodine	No action advised.
S.2188 ..	Channel Islands Milk ..	Informal	Fat content only 3·75 per cent.	Ministry of Food informed.
S.2192 ..	Oranges ..	Informal	Juice from oranges contained 18 parts per million thiourea	Importers cautioned and Port Health Authority and Ministry of Food informed.
N.1969 ..	Curry Powder ..	Informal	Contained 11·4 per cent. salt and 25 per cent. Pea or Bean flour in addition to spices. The Standards Order requires not less than 85 per cent. spices	Old stock. Remainder of stock withdrawn from sale.
N.2011 ..	Orange Drink ..	Informal	No name of the food except the words "Orange ready to drink"	Packers communicated with.
E.2925 ..	Orange Drink ..	Informal	Label should bear the name of the food and the name and address of the packers	Packers agreed to alter label.
N.2056 ..	Zinc Ointment ..	Informal	Contained 11·5 per cent. zinc oxide. Deficient 2·5 per cent. of the minimum B.P. limit	Existing stocks withdrawn by packers for examination.
S.2270 ..	Glycerin ..	Informal	Contained 2·4 per cent. excess water	Packers took steps to avoid a similar occurrence in future.
S.2290 ..	Tapioca ..	Informal	Contained two small fragments of mouse excreta	No further stock remaining.
C.1560 ..	Peas, Canned ..	Informal	pH. value 4·4 Acidity (as lactic acid) 0·42 per cent. Sample tasted sour	Packers communicated with. Souring due to rolling of seam of can being uneven and due to high pressure of temperature involved in canning might have opened slightly and closed again.
S.2316	Beef Sausages	Informal	Meat content only 47·5 per cent.	Manufacturers communicated with.
N.2111 ..	Tincture of Iodine ..	Informal	Iodine and Potassium Iodide both 0·13 per cent. above maximum B.P. limits	Packers communicated with.
N.2132 ..	Ice Lollies ..	Informal	No list of ingredients on label	Packers interviewed. Agreed to alter labels.
N.2133 ..	Ice Lollies ..	Informal	Sample contained milk or ice-cream not included in list of ingredients	Packers communicated with.

Table 24 continued.

No. of Sample.	Description.	Formal, Informal. or Private.	Nature of Adulteration or Irregularity.	Observations.
N.2153 ..	Orange Drink ..	Informal	No name of the food except the word " Orange "	Packers communicated with.
S.2395	Toffee ..	Informal	Ingredients in wrong order in list of ingredients and " condensed milk " should read " condensed skimmed milk "	Packers agreed to alter labels so that they comply with the labelling of Food Order.
C.1594 ..	Orange Drink ..	Informal	Labelled " Orange Drink." Should be labelled " Whole Orange Drink, ready for use "	Packers interviewed.
C.1595 ..	Orange Drink ..	Informal	Labelled " Orange Drink." Should be labelled " Whole Orange Drink, ready for use "	Packers interviewed.
S.2514 ..	Skimmed Milk and Fat Compound ..	Informal	Incomplete list of ingredients. No reference to emulsifying agents, etc.	Further sample satisfactory.
S.2552 ..	Camphorated Oil	Informal	Not prepared with arachis oil as required by the B.P.	Old stock. Stock withdrawn from sale.
N.2317 ..	Tapioca ..	Informal	Consisted of Sago	Vendor notified.
N.2326 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
N.2333 ..	Sago ..	Informal	Consisted on Tapioca	Vendor notified.
N.2353 ..	Ice-Cream ..	Informal	Fat content only 3·3 per cent.	See No. N.2595.
N.2374 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
N.2421 ..	Pork Sausages ..	Informal	Meat content 62·5 per cent.	No action advised.
N.2416 ..	Beans, Canned ..	Informal	Tin content 310 parts per million	Further sample genuine.
N.2488 ..	Pork Sausages ..	Informal	Meat content 59 per cent.	Vendor gave assurance to increase meat content to at least 65 per cent.
S.1448 ..	Pork Sausages ..	Informal	Meat content 58 per cent.	Vendor undertook to prevent a recurrence of this error in manufacture in future. See No. S.2834.
N.2561 ..	Marjoram, Dried ..	Informal	Sand and other siliceous matter 6·2 per cent., *i.e.* an excess of 1·7 per cent.	Old stock. Packers communicated with.
N.2562 ..	Fresh Fruit, Pears ..	Informal	Contained lead 4·1 parts per million and Arsenic (as As) 1·7 parts per million. Recommended maximum limits Lead 2 parts per million, Arsenic (as As) 1 part per million	Port Health Authority, Importers and Ministry of Food informed.

Table 24—continued.

No. of. Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
S.2796 ..	Beef Sausages ..	Informal	Contained 120 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor cautioned.
S.2798 ..	Pork Sausages ..	Informal	Meat content 62·5 per cent.	No action advised.
C.1510 ..	Ice-Cream ..	Informal	Contained only 4·1 per cent. fat	Vendor interviewed and cautioned.
C.1725 ..	Ice-Cream ..	Informal	Fat content only 4·8 per cent.	Further sample genuine.
N.2595 ..	Ice-Cream ..	Formal	Deficient 34 per cent. of the minimum percentage of fat	Article 1. Food Standards (General Provisions) Order. Fined £2 and £4 4s. costs.
N.2620 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
S.2823 ..	Orange Squash, Concentrated ..	Informal	Contained 390 parts per million sulphite preservative expressed as sulphur dioxide, *i.e.* 40 parts per million in excess of the permitted limit.	Packers undertook to prevent a recurrence in future.
S.2834 ..	Pork Sausages ..	Informal	Meat content only 61 per cent.	Referred to Food and Drugs Authority of Vendor's Area.
E.3244 ..	Boric Acid Ointment ..	Informal	Contained 11·0 per cent. Boric Acid. Consisted of Ointment of Boric Acid B.P. 1932	Old stock. Stock withdrawn from sale.
E.3245 ..	Sago ..	Informal	Consisted of Tapioca	Vendor notified.
N.2635 ..	Ice-Cream ..	Informal	Fat content only 3·1 per cent.	Further sample not obtainable. Vendor no longer making this commodity.
N.2636 ..	Pork Sausage ..	Informal	Meat content only 51 per cent.	Further sample genuine.
S.2822 ..	Concentrated Orange Drink with Glucose	Informal	Glucose solids not more than 2 per cent. yet claim made "with added Glucose"	Packers communicated with.
S.2857 ..	Borax ..	Informal	Arsenic 25 parts per million *i.e.* 21 parts per million above maximum B.P. limit yet labelled "Pure"	Consisted of domestic borax. Packers agreed to delete the word "Pure" from label.
E.3305 ..	Dried Thyme ..	Informal	Sand and siliceous matter 4·7 per cent. *i.e.* 0·7 per cent. excess	No action advised.
E.3356 ..	Fresh Orange Drink ..	Informal	Contained only 4·8 per cent. orange	No action advised.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.3357 ..	Camphorated Oil B.P.	Informal	Camphor 18·4 per cent. Minimum B.P. limit 19·0 per cent.	Old stock. Packers no longer making camphorated oil.
E.3378 ..	Pure Devon .. Cream, Canned	Informal	Fat content 22·6 per cent. Minimum standard is 23 per cent.	Packers took steps to prevent a recurrence in future.
C.2020 ..	Whisky ..	Formal	Contained 11·6 per cent. excess water	Section 3 Food and Drugs Act, 1938. Fined £10 and £4 4s. costs.
E.3490 ..	Almond .. Oil	Informal	Contained 1·8 per cent. water. Appearance of having been placed in wet bottle	Vendor undertook to prevent a recurrence of this in future.
E.3544 ..	Beef .. Sausages	Informal	Contained 270 parts per million sulphite preservative (expressed as sulphur dioxide) without declaration	Vendor cautioned.
C.2073 ..	Cream .. Cakes	Informal	Filling consisted of sweetened imitation cream	Notice *re* Fresh Cream in cakes no longer displayed in shop.
E.2951 ..	Milk ..	Informal	Contained 2·3 parts of moist dirt per 100,000 of the sample. Dirt had the character of dung and siliceous matter	Same vendor. Vendor cautioned and Ministry of Agriculture and Fisheries informed.
E.2952 ..	Milk ..	Informal	Contained 2·4 parts of moist dirt per 100.000 of the sample. Dirt had the character of dung and siliceous matter	
E.2935 ..	Milk ..	Informal	Contained 1·1 parts of moist dirt per 100,000 of the sample. Dirt had the character of dung and siliceous matter	
C.2134 ..	Penicillin .. Tablets	Informal	Contained only 130,000 units of Penicillin per tablet. Should contain 200,000 units	See sample No. C.2178.
C.2178 ..	Penicillin .. Tablets	Informal	Contained only 105,000 units of Penicillin per tablet. Should contain 200,000 units.	Same vendor as sample No. C.2134. Deficiency apparently due to storage conditions. Remainder of stock returned to manufacturers.
C.2188 ..	Strawberry .. Jam (Part jar)	Informal	Remainder of jam in jar contained piece of glass 6·5 mm long	Manufacturers communicated with.
E.3613 ..	Baby Food ..	Informal	Carton tainted with phenolic substances—none detected in contents	Vendor interviewed *re* storage.

Table 24—continued.

No. of Sample.	Description.	Formal, Informal or Private.	Nature of Adulteration or Irregularity.	Observations.
E.3630 ..	Orange Drink ..	Informal	Contained only 4·1 per cent. Orange	No action advised.
S.3186 ..	Orange Drink ..	Informal	Labelled " Morning Orange—ready to drink "	Packers agreed to alter label. See sample No. E.2995.
E.3761 ..	Pearl Barley ..	Informal	Infested with live and dead mites	No further stock left.
E.2995 ..	Orange Drink ..	Informal	Should be labelled ". . .'s Orange drink—ready for use"	See sample No. S.3186.
N.2832 ..	Mincemeat ..	Informal	Fat content only 2·3 per cent. Minimum standard is 2·5 per cent. fat	Manufacturers advised to increase suet content of this commodity.
N.2842 ..	Dripping ..	Informal	Free Fatty Acids (as Oleic Acid) 2·0 per cent. Should not contain more than 1·5 per cent. free fatty acids	Vendor notified.
S.3458 ..	Margarine ..	Informal	Vitamin A content only 595 international units per ounce against minimum requirement of 760 international units per ounce	Manufacturers undertook to prevent a recurrence of this in future.
C.2569 ..	Marzipan ..	Informal	Ground Almond content only 19 per cent.	No action advised.
C.2570 ..	Malt Extract .. with Cod Liver Oil	Informal	Protein 3·3 per cent. equivalent to 3·7 per cent. in the original malt extract used. Malt extract should contain not less than 4·0 per cent. protein	Manufacturers took steps prevent a similar deficiency in future.
N.2895 ..	British Sherry ..	Informal	Contained 26·0 per cent. proof spirit. Declared 26·75 per cent. proof spirit	No action advised.
N.2901 ..	Dripping ..	Informal	Sample had rancid taste and contained 3·3 per cent. free fatty acid	Stock withdrawn from sale.
N.2959 ..	Christmas Pudding ..	Informal	Fat content only 5·5 per cent.	Manufacturer interviewed. Agreed to give attention to this matter in future.
S.3607 ..	Whisky ..	Formal	Contained 2·3 per cent. excess water	Vendor cautioned. Further sample genuine.
E.3945 ..	Shredded Beef Suet ..	Informal	Deficient 3·0 per cent. fat	Packers gave assurance that they would endeavour to prevent a similar deficiency in future.
S.3644 ..	Cheese Spread ..	Informal	Contained only 43·9 per cent. fat on the dry matter	No action advised.

THE LABELLING OF FOOD ORDER.

The first Labelling of Food Order was made in the year 1944 but it has been amended or re-enacted on several occasions since that time. The Order at present in operation is the Labelling of Food Order, 1953, which came into operation on the 5th April of that year. No amendment to the Order was made during the year 1954.

During the year under review 46 samples (20 County and 26 from Autonomous Authorities) were found to contravene one or the other of the requirements of the Labelling of Food Order. Brief details of the 20 County samples will be found in table 24. Of the total number of samples to which exception was taken 38 (18 County) had labels which did not disclose one or more of the following requirements ; the name and address of the packer, the name of the food or a correct list of ingredients. In addition, four samples of alcoholic liquors (wine cocktails, etc.), submitted by an Autonomous Food and Drugs Authority did not comply with the special requirements as to the labelling of liquors laid down in Part V., of the Order. In each of the above instances the packers were communicated with and their attention drawn to the requirements of the Order. During the year 1953 only 12 samples had incomplete labels as against the 38 samples under this heading for the year under review. The increase is, however, almost entirely due to incomplete or unsatisfactory labels on samples of orange drinks sold in one-third pint bottles ; exception has been taken to 24 (12 County) of these during the year 1954. These samples are discussed further in the section of this report which deals with soft drinks. In the following paragraphs reference is made to three of the more interesting samples, in relation to their labels, submitted by County Sampling Officers.

Table Creams, Sample No. C.1226.

This informal pre-packed sample bore a label which stated the ingredients to be :—" Sugar, cornflour, gelatin, salt, flavouring, colouring." Upon analysis the sample was found to contain 69 per cent. of sucrose, 16·5 per cent. starch and 9·7 per cent. gelatine and it conformed to the standard prescribed in the Food Standards (Table Jellies) Order, 1949, for table jelly compounds which are intended to be made up with milk. In view of the fact that the name " Table Creams " did not identify this product as a table jelly compound the packers were communicated with and it was pointed out to them that the Labelling of Food Order requires a pre-packed food to be labelled with its common or usual name. In their reply the firm concerned intimated that their label had already been considered by the Ministry of Food ; the product was previously described as " Table Cream " but the Ministry were satisfied when this was altered to " Table Creams " and a list of ingredients included in the label. A list of ingredients is not usually required for products which are the subject of Food Standards Orders. In view of the action already taken by the Ministry of Food, no further objection was taken to this label.

Toffee, Sample No. S.2395.

The wrappers on this informal sample of toffee bore a list of ingredients which read :—" Sugar, corn syrup, shortening, condensed milk, butter, walnuts, salt, natural and artificial flavours." Sweets are exempt from the requirements of the Labelling of Food Order and a list of ingredients is not, therefore, compulsory ; in instances where such a list is given voluntarily it should, in the opinion of your Analyst, be a correct list given in the appropriate order, with the ingredient in greatest proportion by weight specified first. Upon analysis the ingredients of the toffee were found to include :—Condensed skimmed milk 25 per cent., shortening 17 per cent., walnuts 6 per cent. and butter 1·5 per cent. The list of ingredients was, therefore, incorrect in its order in that " shortening " should follow " condensed milk " and " butter " should follow " walnuts "; furthermore, the ingredient listed as " condensed milk " should read " condensed skimmed milk." The manufacturers of the toffee were communicated with and they agreed to review all their labels and make any necessary alterations.

Whole Orange Drink with added Glucose, Sample No. S.2822.

This informal sample of a whole orange drink for consumption after dilution (*i.e.* a squash) bore on the label the words " with added Glucose." The label also bore a trade name but this was not accompanied by the words " Registered Trade Mark " nor was the name and address of the packer given. The Labelling of Food Order stipulates that one or other of these latter requirements should be complied with and following representations made to the packers this has since been carried out. With regard to the analysis of the drink itself it was found that it contained sucrose 17·5 per cent. w/w, and invert sugar 17·6 per cent. w/w these figures corresponding to a total sugar content of approximately 41/4 per cent. w/v. Glucose (Dextrose) could not have been added to the extent of more than 2 per cent. The Food Standards (Soft Drinks) Order requires only 7½ per cent. w/v of added sugar in this type of drink but, after allowing for the natural sugars in the whole orange present, there was in this instance some 25 per cent. w/w or 30 per cent. w/v additional sugars calculated on the sample. These sugars were, however, almost entirely in the form of sucrose and invert sugar ; in this connection it must be remembered that in the case of soft drinks which comply as to composition with the requirements of the Food Standards (Soft Drinks) Order, it is not necessary to include on the label a list of ingredients. The packers were communicated with and it was pointed out that in view of their claim " with added Glucose " it was, in our opinion, desirable that a considerable proportion of the additional sugars should be in the form of Glucose. In the course of the very prolonged correspondence which resulted, it became apparent that the packers were relying mainly on the fact that invert sugar is itself a mixture of glucose (dextrose) and laevulose. Usually, however, glucose (dextrose) is regarded as being the pure sugar which has been separated from the hydrolysis products of starch ; liquid glucose or corn syrup is an intermediate product derived from the same source and it consists of a mixture of dextrose, maltose and dextrins. The products described as dextrose and liquid glucose in the British Pharmacopoeia are prepared in this way and there is no doubt, in your Analyst's opinion, that to supply invert sugar, which results from the inversion of sucrose and which contains only 50 per cent. of its sugars in the form of glucose (dextrose), in answer to a request for glucose or dextrose, per se, would constitute an infringement of the Food and Drugs Acts. The point disclosed here is a technical one of considerable interest and adds further to the confusion which already may result from the use of the term " liquid glucose " or even simply the word " glucose " when referring to the mixture of sugars also known as " corn syrup." Liquid glucose or corn syrup as normally manufactured contains only approximately 20 per cent. of its total sugar content in the form of actual glucose (dextrose). In the case of the particular sample under discussion a voluntary claim of the presence of one of the two constituents of invert sugar without disclosing the presence of the other is only possible because the Food Standards (Soft Drinks) Order does not require a list of ingredients to be declared in respect of commodities which come within the scope of the Order.

The Mineral Oil in Food Orders.

The principal Order came into operation on the 9th April, 1949, and it prohibited the use of mineral oil in the composition or preparation of any article of food intended for sale for human consumption. There is an exemption if the mineral oil content does not exceed 0·2 per cent. by weight of the food and its presence is due not to its use as an ingredient but to its use as a lubricant or greasing agent on a surface with which the food comes in contact during its preparation. A further exemption resulted from the making of the Mineral Oil in Food (Amendment) Order, 1950, which came into operation on the 1st August of that year and which excludes certain dried fruits (prunes, currants, sultanas and raisins) containing not more than one per cent. by weight of mineral oil, or any food containing mineral oil as a result of the use of such dried fruit as an ingredient, from the provisions of the Order.

On the 19th October, 1952, another amendment came into operation which reduced the amount of mineral oil permitted in dried fruits from 1·0 per cent. to 0·5 per cent. In Circular Letters published about the time of the amendments the Ministry of Food explained that in the countries of origin large stocks of the dried fruits in question are treated with mineral oil as a deterrent to infestation, to prevent crystallization and to facilitate separation of the individual berries in manufacturing processes. Exporting countries have been asked to stop the use of mineral oil in dried fruit intended for this country but up to date no satisfactory substitute has been found although it is hoped that it will be possible eventually to cease this practice. The amount of mineral oil actually present in samples of dried fruit is usually well below 0·5 per cent. and it is for this reason presumably that the original permitted limit has been reduced from 1·0 per cent. to 0·5 per cent.

A third amendment to the principal Order has been made during the year under review, the Mineral Oil in Food (Amendment) Order, 1954, which came into operation on the 8th August, 1954, extends the exemptions from the Order to include citrus fruits which contain not more than 0·1 part by weight of mineral oil per 100 parts by weight of the fruit. The use of such citrus fruit is, consequently, also permitted when it occurs in the composition of other articles of food.

During the year under review, 69 samples (62 County) of Flour Confectionery (jam tarts, cakes, etc.) were examined and all were found to be free from mineral oil. In addition 15 samples (all County) of fresh citrus fruit (oranges, lemons, grapefruit, etc.) and 71 samples (58 County) of dried fruit (prunes, currants, raisins and sultanas) were also examined for the presence of mineral oil and in no instance did any of these samples contravene the Mineral Oil in Food Order, 1949, as amended.

Within recent years, flour confectionery and the other commodities mentioned above have sometimes been adulterated with mineral oil; for that reason special mention is made of the number of samples examined under the above headings. In addition, however, it has been customary for many years to examine all samples of edible oils and fats (*i.e.* butter, margarine, lard, cooking fat, olive oil, etc.) for the presence of mineral oil. In no instance in respect of these and other samples examined during the year was the presence of any mineral oil or paraffins detected.

CREAM, ARTIFICIAL CREAM, SYNTHETIC CREAM AND WHEY CREAM.

Until the year 1953 the manufacture or sale of fresh cream had been prohibited, except for a short period between the 9th May and 1st July 1951, since the year 1940. On the 1st April, 1953, however, the Cream and Use of Milk (Revocation) Order came into operation thereby removing control over the manufacture and sale of cream. The same Order also removed the prohibition on the use of milk in the manufacture of bread, biscuits, cakes, ice-cream, synthetic cream and other products.

Although the sale of Fresh Dairy Cream is now free from control new restrictions have recently been placed on the sale of cream substitutes. This new legislation is contained in Section 12 of the Food and Drugs Amendment Act, 1954 and, as already indicated at the beginning of this report, prohibits the use of the word " cream " (even if only part of a composite word) for any substance resembling cream, whether sold singly or as part of another food. The only exceptions are reconstituted and imitation cream sold as such or a substance sold under a description which indicates that it is not for use as, or as a substitute for, cream.

There are in force today Statutory Standards for single cream, double cream, sterilized cream and for clotted cream. There are also recommended limits for artificial (reconstituted) cream, for artificial (reconstituted) double cream and for synthetic (imitation) cream. In addition, mention should be made of whey cream—the product obtained by concentrating the small amounts of butter fat present in whey. It normally has a butter fat content equal to that of double cream but it can be distinguished from the latter in that, as is to be expected, the protein and calcium in the non-fatty solids of whey cream are appreciably lower than in the case of cream made from whole milk. In the following paragraphs will be found details of the standards and recommended limits for the different types of cream, artificial cream and synthetic cream.

At the time that the restrictions on the sale of cream were temporarily removed in the year 1951 the Minister of Food made the Food Standards (Cream) Order which is enforced by Food and Drugs Authorities and which prescribes standards of composition for cream, sterilised cream, thick cream and clotted cream. The standards are as follows :—

> " 1.—Except as respects clotted cream, cream shall consist of that part of cows' milk rich in fat which has been separated by skimming or otherwise and—
>
> (*a*) no cream, whether described as cream, single cream, pouring cream, coffee cream, fruit cream or as any other description of cream, shall contain less than 18 per cent. by weight of milk fat ;
>
> (*b*) no sterilised cream shall contain less than 23 per cent. by weight of milk fat ;
>
> (*c*) no double cream or thick cream shall contain less than 48 per cent. by weight of milk fat.

" 2.—Clotted cream shall consist of that part of cows' milk rich in fat which has been produced and separated by the scalding, cooling and skimming of cows' milk or cream and shall contain not less than 48 per cent. by weight of milk fat."

The Food Standards Committee of the Ministry of Food also submitted two reports during the year 1951 on the advisability of making standards of composition for both artificial cream and for synthetic cream A brief account of these reports is contained in the next paragraphs.

Artificial cream is defined in the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, as—

> " an article of food which, though not cream, resembles cream and contains no ingredient which is not derived from milk except water or any substance which may lawfully be contained in an article sold as cream, being some substance not injurious to health which in the case of cream may be required for its production or preparation as an article of commerce in a state fit for carriage or consumption and which has not been added fraudulently to increase bulk, weight or measure or conceal inferior quality."

This commodity is, therefore, normally made from butter and milk powder but, production, at present, is very limited. After hearing evidence from all the interests concerned the Committee were of the opinion that standards for artificial cream were desirable and that these should be prescribed to cover both a thin and a thick artificial cream. As in the case of fresh cream, there did not appear to be sufficient justification to require a declaration of the fat content on the label. Notwithstanding the use of the term " artificial cream " in the Food and Drugs Acts the Committee and others considered that this term could more appropriately be applied to so-called synthetic or imitation cream and that the term " reconstituted cream " would be a more informative description of this particular dairy product.

The recommendations of the Committee, therefore, were—

" (*a*) a suitable opportunity should be taken to substitute the term reconstituted cream for the term artificial cream in the Food and Drugs Acts ;*

" (*b*) statutory standards for reconstituted cream (or for artificial cream until such time as the Food and Drugs Acts may be amended) derived from cows' milk should be prescribed as follows, *viz.*—

Reconstituted cream.—Not less than 18 per cent. milk fat.

Reconstituted double cream.—Not less than 48 per cent. milk fat."

---

* This recommendation has been followed in Section 12 (3) of the Food and Drugs Amendment Act, 1954.

There is no standard or definition of synthetic cream in the Food and Drugs Acts. Synthetic cream was first manufactured on a large scale in this country in the year 1928. It is used largely by confectioners and catering establishments and is made from a variety of oils or fats together with emulsifying and stabilising agents. Besides synthetic creams which contain a reasonable proportion of fat there are other cream-like emulsions made with methyl cellulose, mono-glycerides, etc., which contain little or no fat and which have a negligible nutritional value. Until the revocation of the Food Substitutes (Control) Order, in 1950, the manufacture of synthetic cream was only allowed by licence and this prescribed the formula to be used ; even to-day the Labelling of Food Order requires the ingredients to be declared on the label whenever this commodity is pre-packed for retail sale. The Committee also drew attention in their report to the doubt as to the advisability of using the description " Synthetic Cream " in connection with cream substitutes. The use of the word " synthetic " here may be held to be misleading in that it is at variance with its scientific meaning, and furthermore, the name might be held to be a false trade description under the Merchandise Marks Acts, 1887 to 1953, in the same way that the expression " non-brewed vinegar " was held to be a false trade description. It was felt that a description less open to legal objection would be imitation cream* and this expression has been used by the Committee in their recommendations which are as follows—

" (*a*) imitation cream should be defined as—

> an article of food which in appearance resembles cream and is produced by emulsifying one or more edible oils and/or fats with water and other substances to give a stable wholesome product but does not include artificial (reconstituted) cream ;

" (*b*) imitation cream should contain at least 25 per cent. fat and/or oil in the form of triglycerides ;

" (*c*) the standard should apply equally to products sold as mock cream, substitute cream, or under any other description suggesting that the product is an imitation cream ;

" (*d*) preparations sold for making imitation cream should be of such a composition that the imitation cream, when made in accordance with the instructions given on the label, complies with the standard.

" The Committee also recommend that the ingredients of imitation cream, and preparations sold for making imitation cream, should be disclosed on the label."

---

* This description has also been adopted in Section 12 (3) of the Food and Drugs Amendment Act, 1954.

During the year under review the following samples were submitted for examination by County Sampling Officers and by Autonomous Food and Drugs Authorities—seven samples of Double Cream, 37 of Sterilised Cream and one of Imitation Cream. No samples of reconstituted cream or of whey cream were examined during the year. In addition to the above, three samples of Imitation Cream Powder were analysed and, if made up according to the directions, it was found that they would make imitation cream which complied with the recommended limit for fat content. With two exceptions all the above samples were reported as genuine. An informal sample of Thick Cream submitted by an Autonomous Authority bore no name and address of the packer or net weight or volume of contents on the label. The packer was communicated with and correct labels are now in use. The remaining unsatisfactory sample consisted of Sterilised Cream (No. E.3378) submitted by a County Sampling Officer ; this, on examination, was found to have a fat content of only 22·6 per cent. As already indicated, the Food Standards (Cream) Order requires Sterilised Cream to contain not less than 23 per cent. by weight of milk fat. The packers were communicated with and undertook to prevent any deficiency in fat content occurring in future.

A sample of Trifle Cream submitted by an Autonomous Authority and not mentioned in the samples listed above was found on analysis to consist of sweetened imitation cream. The packers were interviewed and correct labels are now in use.

Ice-Cream.

The first Standards Order for ice-cream was made in March, 1951, but due to shortages of fats and milk powder it was soon found impossible to maintain the standards then formulated without reducing supplies of ice-cream. The Minister of Food, therefore, introduced, as a temporary measure, reduced standards for fat and milk solids other than fat in July, 1952. During the year 1953, however, the supply position improved again and the Food Standards (Ice-Cream) Order, 1953, which came into operation on the 1st June, 1953, restored the original standards fixed in the year 1951. It should be remembered that even these standards are not ideal and when they were originally recommended by the Food Standards Committee of the Ministry of Food the Committee considered that the standards should be amended and progressively improved as supplies of ingredients became more plentiful. Furthermore, the Committee considered that the description “ ice-cream ” should eventually be restricted to a dairy product containing a high proportion of milk solids.

The present standard for ice-cream contained in the Schedule to the 1953 Order is as follows :—

> " 1. Ice-cream shall contain not less than five per cent. fat, 10 per cent. sugar and 7½ per cent. milk solids other than fat :
>
> Provided that—
>
> (i.) ice-cream containing any fruit, fruit pulp or fruit puree shall either conform to the standard set forth above or, alternatively, the total content of fat, sugar and milk solids other than fat shall be not less than 25 per cent. of the ice-cream including the fruit, fruit pulp or fruit puree, as the case may be, and such total content of fat, sugar and milk solids other than fat shall include not less than 7½ per cent. fat, 10 per cent. sugar and two per cent. milk solids other than fat :
>
> (ii.) ' Parev ' (kosher) ice sold, offered or exposed for sale under that description shall contain not less than 10 per cent. fat and not less than 14 per cent. sugar, and the standard for ice-cream set forth above shall not apply to this product.
>
> " 2. For the purpose of the standards prescribed above ' sugar ' means sucrose, invert sugar or the solids of any sweetening material derived from starch so however that no ice-cream shall contain less than 7½ per cent. sucrose.
>
> " 3. Each reference in this Schedule to any proportion or percentage means that proportion or percentage by weight."

It should be noted that the improvement in the fat content of ice-cream found over the previous six years, is still being maintained. A persual of table 25 shows that the average fat content in 1946 was only 2·3 per cent. whereas in 1953 it was 8·6 per cent. and in the year under review 9·2 per cent. This last figure is, in fact, the highest average fat content recorded in the table ; furthermore, the lowest fat content during 1953 was 2·5 per cent. and in 1954, 3·1 per cent.; whereas in the four years 1946 to 1949 fats as low as 0·3 and even 0·1 per cent. were found.

The average fat content of ice-cream has increased in striking manner since 1946, but the big increases noted since 1948 were, in the first place, due to the action of the Ministry of Food in allocating from November, 1948 additional supplies of sugar and in certain cases fats to those ice-cream manufacturers who, at that time, undertook to include at least 2·5 per cent. fat in their ice-cream. This step to increase the quality of ice-cream was taken more than two years before the first statutory standard for ice-cream was made.

During the year 1954, 90 samples of ice-cream were submitted for chemical analysis, 52 by County Sampling Officers and 38 by Autonomous Food and Drugs Authorities. Although no harmful ingredients were found in any of the samples, nine (five County and four from Autonomous Authorities) did not comply with the Food Standards (Ice-Cream) Order. In the year 1953, 17 samples were reported upon adversely. The five County samples were all deficient in fat. In the case of the 38 samples from Autonomous Authorities, three were deficient in fat and one was deficient in sugar. Successful legal proceedings were instituted in respect of one sample seriously deficient in fat which was submitted by a County Sampling Officer. Details of the incorrect County samples, together with the action taken will be found in table 24.

The average figures found for the 90 samples were—total solids 34·6 per cent. (maximum 44·0 ; minimum 24·8) and for fat content 9·2 per cent. (maximum 13·8 ; minimum 3·1). These figures as will be seen from the following table, which includes figures for the last nine years, show that the big improvement noted in the year 1950 has been maintained. It will be remembered that prior to the war a figure of eight per cent. was suggested by a trade association as a minimum standard for fat content and it is interesting to note that during the year under review, 63 samples out of the total of 90 showed fat contents varying from 8·1 per cent. to 13·8 per cent.

Table 25.

Ice-Cream.

YEAR.	Number of Samples	Fat Content Average %	Total Solids Average %	Highest Fat %	Lowest Fat %	Highest Total Solids %	Lowest Total Solids %
1946 ...	45	2·3	22·5	10·7	0·1	36·8	13·3
1947 ...	59	3·0	23·6	10·6	Less than 0·1	39·2	14·1
1948 ...	53	3·9	25·3	11·3	0·1	33·4	18·9
1949 ...	171	6·4	29·3	13·3	0·3	45·9	14·7
1950 ...	186	8·5	32·1	14·7	2·2	43·0	20·1
1951 ...	230	8·6	32·6	15·6	3·3	40·7	23·0
1952 ...	143	9·0	32·8	13·7	2·0	40·0	19·6
1953 ...	130	8·6	32·7	15·2	2·5	42·3	23·3
1954 ...	90	9·2	34·6	13·8	3·1	44·0	24·8

ICE LOLLIES.

During the year under review 30 samples (21 County) of ice lollies were submitted for examination under the Food and Drugs Acts. Unlike ice-cream there is no statutory standard for the composition of ice lollies. They are specifically excluded from the provisions of the Food Standards (Ice Cream) Order while the Food Standards (Soft Drinks) Order refers only to liquid soft drinks although ice lollies are, in general, similar in composition to soft drinks. Ice lollies and ice-cream are, however, both specifically mentioned in the revised report on lead of the Food Standards Committee of the Ministry of Food which was published in the year under review. In this report a maximum limit of one part per million for lead is recommended for both types of commodities. The limit for the majority of other foods being two parts per million.

In no instance out of the 30 samples examined was an excessive amount of any toxic metal found. The only three samples reported upon adversely were in respect of failure to comply with the Labelling of Food Order. All three were pre-packed ; of these, two bore no list of ingredients on the wrapper and the remaining sample contained milk or ice-cream but neither of these were included in the list of ingredients printed on the label.

In addition to the recommended limit for lead referred to above the recommended limits for certain other toxic metals in most solid foods are as follows : arsenic one part per million, copper 20 parts per million and zinc 50 parts per million. In regard to the samples under discussion all were found to be free from significant amounts of arsenic. Lead, which is probably the most important of the toxic metals because of its cumulative effect, was found in 12 of the 30 samples but the highest amount was 0·8 part per million, the next highest being 0·69 part per million, figures which are well within the recommended maximum limit. Traces of copper were also found in 12 samples but here again the highest amount found was only seven parts per million. Small amounts of zinc were present in 10 samples but in no instance was the amount found more than one-tenth of the recommended maximum limit.

The total solids (sugars, etc.) in the samples ranged from as little as 1·7 per cent. to 21·4 per cent. with an average for the 30 samples of 10·2 per cent. The average total solids on 37 samples examined in the previous year was 9·0 per cent. while the range of total solids obtained in the years 1952 and 1953 were very similar to the figures given above for the year under review. Five samples showed fat contents varying from 0·95 to 2·1 per cent. but in respect of four of these no claim was made that either milk or ice-cream was present. In the case of the remaining sample the list of ingredients included non-fatty milk solids and fat, in the order stated, and this sample upon analysis was found to contain 1·7 per cent. skimmed milk powder and 1·55 per cent. of fat.

SAUSAGE, MEAT PASTE, FISH PASTE AND MEAT PIES.

On the 1st March, 1953, the last of the Meat Products Orders was revoked and this had the effect of removing all restrictions, for control purposes, on the price and composition of both pork and beef sausages. It should be noted, however, that the Orders mentioned above were made by the Minister of Food for the purpose of controlling the sale of certain commodities which were, or had been, in short supply. Foods and drugs must, in addition, satisfy the requirements of the Food and Drugs Acts. Under section 3 of the 1938 Act a food or drug sold to a purchaser must be of the nature, substance or quality of the article demanded; if no Statutory Standard exists under the Act for the particular article in question a prosecution may still be instituted in respect of a sample regarded as unsatisfactory and the Court itself must then fix a standard based on the evidence before it. In prosecutions by Food and Drugs Authorities in connection with samples of sausage alleged to be deficient in meat it has always been necessary for the Court to fix its own standard (because the standard made by the Minister of Food was not made under the Food and Drugs Acts) although in so doing the Court would have regard to the standard then in operation for commodity control purposes. In view of the increasing supplies of meat available it would appear reasonable to expect that sausages should now have at least the same meat content as in the days of control and two successful prosecutions (one County) were instituted during the year 1954, in respect of samples of pork sausage which were seriously deficient in meat. In these cases the Courts accepted the opinion of your Analyst that genuine pork sausage contains not less than 65 per cent. of meat.

The Meat Products Orders, in addition to controlling price and meat content, also prohibited the use of certain specified offals in the preparation of sausages and other uncooked open meat products intended for human consumption. The restriction on the use of these offals has been re-enacted in the Offals in Meat Products Order, 1953, which came into operation on the 1st March, 1953, and this Order also provides that proceedings for an infringement may be brought by a Food and Drugs Authority without the consent of the Minister of Food.

The compositions of meat paste and of fish paste are controlled by the Food Standards (Meat Paste) Order, 1951, and the Food Standards (Fish Paste) Order, 1951. The standard for meat paste is a minimum of 55 per cent. meat and for fish paste a minimum of 70 per cent. fish. The standards apply to both imported and home produced products. There is no statutory standard for the composition of meat pies but in view of the interest shown in this type of commodity and the possibility of wide variation in meat content, a number of analyses have been carried out during the year. These are tabulated and discussed later in this section.

During the year 1954, 132 samples of sausage, two of sausage meat and one of cocktail sausages were examined, as against 104 samples of sausage and five of sausage meat in the previous year. Eighty-three samples were examined for the County and 52 (including two of sausage meat and one of cocktail sausages) for Autonomous Food and Drugs Authorities ; of these 19 County and 18 submitted by other Food and Drugs Authorities were reported upon adversely. Of the 37 samples reported as not satisfactory, two (one County) seriously deficient in meat were the subject of successful prosecutions ; a perusal of table 24 will show, however, that several of the unsatisfactory County samples were only slightly deficient in meat. Of the total number of sausage samples submitted during the year under review, 64 (including one sausage meat) consisted of beef and 70 of pork sausage (including one sausage meat) ; the remaining sample consisted of cocktail sausages. Six of the samples (two County) examined contained normal amounts of sulphite preservative but without any declaration of the presence of preservative being exhibited in the shops concerned. This is contrary to the requirements of the Public Health (Preservatives, etc,. in Food) Regulations, 1925–1953. Details of all the adulterated County samples, together with the action taken, will be found in table 24.

It is interesting to note that the average meat content of 63 samples of beef sausage examined in the County Laboratory during the year 1954 was 60·8 per cent. Similarly, the average meat content of 69 samples of pork sausage (including six samples which were seriously deficient in meat) examined over the same period was 64·5 per cent. One sample of pork sausage meat submitted by an Autonomous Authority showed a meat content of only 52·0 per cent. but a sample of pork sausages obtained later from the same source was found to have a meat content of 64·0 per cent. One sample of beef sausage meat also submitted by an Autonomous Authority had a meat content of 52 per cent. Bearing in mind that the standards before the 1st March, 1953, under the Commodity Control Order were a minimum of 50 per cent. meat for beef sausage and beef sausage meat and a minimum of 65 per cent. meat for pork sausage and pork sausage meat ; the average figure obtained in the County Laboratory since control was removed for beef sausages is very satisfactory. In fact of 63 samples of beef sausage only four contained less than 50 per cent. meat. With regard to pork sausage the results are not quite so satisfactory although there is an improvement on the results obtained in the previous year. The average meat content of 69 samples was only 0·5 per cent. below the figure of 65 per cent. and, moreover, this average includes six samples seriously deficient in meat. It may be remembered that the average figure for 36 samples submitted during the year 1953 was 1·1 per cent. below 65 per cent. and did not include four seriously deficient samples. Of 69 samples of pork sausages submitted during the year 1954, 27 contained less than 65 per cent. meat but it should, as already mentioned, be noted that this figure only includes six samples seriously deficient. Although this cannot be regarded as satisfactory it must not be assumed that the position with regard to pork sausage has deteriorated since control was removed at the beginning of the year 1953. Fifty per cent. of the pork sausage samples submitted in each of the years 1951, 1952 and 1953 were reported upon adversely. The proportion of unsatisfactory samples for the year 1954 was 39 per cent. and, as already mentioned, the average meat content has also slightly improved. Attention has already been drawn in the section of this report dealing with new regulations, etc., to the fact that the Minister of Food is keeping the question of the meat content of sausages under constant review and for that purpose has requested Public Analysts to give particulars in their quarterly reports of the price and meat content of all samples of sausage analysed by them.

Eight samples of meat paste (four submitted by County Sampling Officers and four by Autonomous Authorities) were examined during the year. All the samples were found to be satisfactory.

With regard to fish paste, 22 samples (15 County) were submitted for examination during the year 1954. Of these, two samples submitted by an Autonomous Authority, both from the same vendor, were found to be deficient in their fish content and the vendor was cautioned.

Thirty samples of meat pies were examined for meat content during the year under review, all submitted by County Sampling Officers, and the following results obtained.

Average Filling per cent.	Average Meat Content in Filling per cent.	Average Meat Content of Whole Pie per cent.	Highest Meat Content of Whole Pie per cent.	Lowest Meat Content of Whole Pie per cent.	Average Fat Content of Pastry per cent.
32·8	69·8	22·9	33·0	15·1	22·8

The weight of the individual pies examined varied from 1½ ozs. to 5½ ozs. The meat content of the filler in the table above is expressed as fat in the filler plus defatted meat containing 3·4 per cent. nitrogen. The meat content of the whole pie is then obtained by calculation, no regard being paid to fat present in the pastry; neither has any regard been given to variation from the original meat content of the pie before baking due to possible loss of moisture from the pastry and meat during cooking. It is necessary to specify the method of obtaining the meat content because, unlike sausage in which the meat is normally uncooked and in which any fat is derived from and is part of the meat content, a meat pie consists of pastry and filling containing, or consisting of, cooked meat and there is often considerably more fat associated with the pastry than is present in the meat filling. In the figures given in the above table it is assumed that none of the fat associated with the pastry has been derived from the meat during baking. On the basis of the above results 22 per cent. would appear to be a reasonable meat content for pies of this size. The figures obtained, however, were very variable and of the 30 samples examined 16 contained less than 22 per cent. of meat, one as will be seen from the table, containing only 15·1 per cent.

Fresh Fruit.

It is doubtful even today, whether the average member of the general public would consider that fresh fruits are commodities in which one would expect to find added chemicals. With continual demands for bigger supplies of foods of all kinds, which can best be met by increasing the yield of crops and by preventing wastage during transport and storage, increasing use is being made of chemicals for a number of purposes which will help in the directions indicated, *i.e.* as insecticides, weed killers, fungicides, etc. It is one of the duties of the Public Analyst to see that no harmful quantity of any chemical residue remains on fruit or other food when it is offered for sale. The importance attached to the use of chemicals in food and their proper control has, during the last few years, been increasingly recognised in many countries including the U.S.A. and this country. In the year 1950 the Minister of Agriculture and Fisheries appointed a Working Party to make recommendations for the safety of workers in agriculture and to investigate the possible risks to the general public in regard to the use of toxic chemicals in agriculture. Two reports have been published by the working party, the first in 1951 and the second, which deals with possible residues of toxic chemicals in food, in 1953. It is reassuring to note that the Working Party did not receive any evidence of fatal or non-fatal illness that could be attributed to residues in food resulting from the use of toxic chemicals in agriculture. Arising from the recommendations made in the first report the Minister of Agriculture and Fisheries made the Agriculture (Poisonous Substances) Regulations, 1953, which lay down the safety precautions with which agricultural workers must comply when using certain specified toxic substances including D.N.C., parathion, Schradan, etc.

Lead arsenate has been used for many years, and is still used, to protect growing fruit from the attacks of Caterpillars. It is used particularly on apples to protect them from the larvae of the Codling Moth but pears and even soft fruits may be sprayed with this chemical. The chemical remains on the skin and will eventually be washed off by rain if applied early enough in the growing season. The Ministry of Agriculture and Fisheries advise that this substance should not be used on ripening fruit or near growing vegetables ; in no instance should it be applied to apples later than early July. In reporting on apples and other fruits on which residues of lead and arsenate are found it is usual to follow the recommended limits for lead arsenic suggested in reports of the Food Standards Committee of the Ministry of Food. The recommended maximum limit for lead in most foods is two parts per million and for arsenic (as As) one part per million.

Within recent years the practice has developed of treating citrus fruits with chemicals mainly with the object of preventing rotting or attack by moulds during transport and storage. As an indication of the way in which the amount of analytical work required on samples may increase due to the growing use of chemicals it may be pointed out that, during the year under review, routine samples of citrus fruits were examined for the presence of four substances, *viz.*, thiourea, diphenyl, boron preservative and mineral oil, whereas a few years ago it was not considered necessary to examine fresh citrus fruits for any chemicals.

Thiourea was first suggested in the U.S.A. in 1946 as a spray to prevent stem-rot and growth of mould in citrus fruit. It was, however, found to be very poisonous ; furthermore, it penetrates the skin of the fruit and gets into the juice and was, therefore, not used in that country. Recently, however, it has been used in at least one other country and in January of the year under review the Ministry of Food warned all Local Authorities and Port Health Authorities of the possibility that oranges treated with thiourea might be sent into the country. Thiourea physiologically has a depressing action on the thyroid gland and it inhibits the production of thyroxine ; its presence in any food is prohibited in this country as it is not one of the preservatives permitted under the Public Health (Preservatives, etc., in Food) Regulations, 1925 to 1953. Diphenyl is another chemical which will reduce the rotting of citrus fruits due to green mould and the importation of oranges wrapped in wrappers impregnated with diphenyl has been permitted into this country since the year 1945. The relaxation of the Preservative Regulations was made under Regulation 60 C.A.A. of the Defence (General) Regulations. The Regulation lapsed in December, 1953, but the provision with regard to diphenyl was made permanent in the Public Health (Preservatives, etc., in Food) (Amendment No. 2) Regulations, 1953. It should be noted that diphenyl is only permitted in oranges if its presence is due to the fruit being wrapped outside the United Kingdom in wrappers treated with diphenyl and then only if the amount in the wrappers does not exceed 40 milligrammes per 100 square inches of wrapper, *i.e.*, the standard applies to the wrapper and not to the fruit. Oranges are also sometimes dipped in a solution of borax to inhibit the growth of mould but the importation of fruit so treated into this country would contravene the Preservative Regulations. A very thin layer of paraffin wax or similar substance on the skin of oranges will keep the fruit fresh in appearance for several months as it helps to prevent shrinkage due to evaporation of moisture from the fruit. The presence of not more than 0·1 per cent. of mineral oil in citrus fruit is now permitted by an amendment of the Mineral Oil in Food Order which came into operation on the 8th August of the year under review.

During the year 1954, 53 samples of Fresh Fruit were examined in the County Laboratory, of these 49 were submitted by the County Sampling Officers and four by an Autonomous Food and Drugs Authority. The samples consisted of the following varieties of fruit, 19 Apples, 1 Pears, 27 Oranges, 3 Lemons, 2 Grapefruit and 1 Tangerine. Of these samples, seven (six County) were reported upon adversely. Four samples of Apples and one of Pears contained on their skins amounts of lead and arsenic which were in excess of the permitted limits mentioned above. The amounts of lead found in these five samples varied from 3·0 to 8·2 parts per million and the amounts of arsenic varied from 1·2 to 2·1 parts per million. The remaining two unsatisfactory samples consisted of oranges the juice of which contained 12 and 18 parts per million of thiourea respectively. Details of the six unsatisfactory County samples will be found in table 24.

Soft Drinks.

In December of the year 1953 most of the controls previously exercised by the Minister of Food in respect of soft drinks were revoked. The Standards for soft drinks, however, which were previously incorporated in the Soft Drinks Order, 1947, were continued with minor alterations in the Food Standards (Soft Drinks) Order, which came into operation on the same date that the other controls ceased.

Modifications in the Standards Order which were previously covered by licences issued by the Ministry of Food are that medicated drinks conspiciously and properly labelled as such and glucose beverages which contain not less than 23 per cent. weight in volume of liquid glucose, or alternately not less than 10 per cent. weight in volume of dextrose monohydrate, are exempt from the standards prescribed in the Order. Soft drinks clearly labelled that they are intended for consumption by diabetics are also exempt from the standards in so far as sugar and saccharin content are concerned. Ginger beer and other herbal beers are included in the standards but allowance may be made for any loss in sugar content due to brewing. Specific references to non-alcoholic wine, non-alcoholic cider and non-alcoholic perry no longer appear in the new Standards Order but these presumably are now covered by the general heading " Any other description of soft drink containing fruit juice."

Drinks made from whole fresh oranges are now described as such in the Standards Order and not as " squash made from whole fresh oranges." In this connection, it should be noted that the standard for these drinks requires them to be made from not less than 27½ lbs. comminuted entire fresh oranges per 10 gallons (*i.e.* 27½ per cent. weight in volume) in the case of drinks requiring dilution and from not less than 5½ lbs. of comminuted entire fresh oranges per 10 gallons (*i.e.* 5½ per cent. weight in volume) in the case of drinks ready for consumption ; as prepared for consumption they are, therefore, fruit drinks made from something over 5½ per cent. of whole orange but it would be incorrect to describe them as orange juice or to expect that they could contain the vitamin " C " content of fresh undiluted orange juice. It is equally important to note that the Standards Order does not say that these drinks must " contain " the specified amounts of whole orange but only that they must be " made from " these quantities—there can be quite a difference in the composition of the final products depending on whether or not the interpretation of the phrase " made from " is taken literally.

During the year under review further exemptions from the provisions of the Standards Order were made in the Food Standards (Soft Drinks) (Amendment) Order, 1954, which came into operation on the 22nd August, 1954. Prior to that date fruit juice was only exempted from the requirements of the Standards Order when in a pure undiluted condition ; this exemption has now been extended to include all undiluted fruit juice, with or without added sugar, and any such juice in a concentrated (or frozen) form.

During the year 1954, 94 samples of soft drinks have been examined including 34 samples submitted from Autonomous Food and Drugs Authorities. The total number of samples under this heading submitted during the previous year was 46. Included in the total for the year under review were 32 samples of various types of mineral waters, 13 samples of concentrated soft drinks (squash, etc.), 45 samples of orange drinks in third pint bottles and four non-alcoholic wines.

Of the above samples 32 (18 County and 14 submitted by Autonomous Authorities) were reported upon adversely. Five Orange Drinks (three County) were reported as being deficient in their orange content. One

Orange Squash contained a slight excess of sulphite preservative. Another Orange Drink, in addition to bearing an unsatisfactory label, contained two small fragments of wood. A soft drink the label of which claimed " with added glucose " is discussed in some detail in the section of this report on the Labelling of Food Order and a mineral water submitted by an Autonomous Authority had an unsatisfactory label and the voluntary list of ingredients was not stated in the correct order. The remaining 24 unsatisfactory samples (12 County and 12 from Autonomous Authorities) consisted of Orange Drinks ready for consumption supplied in one-third pint bottles and all of these failed, in the opinion of your Analyst, to comply with the requirements of the Labelling of Food Order in respect of the name given to the drink or by the omission of the name and address of the packer. There are three alternatives for orange drinks ready for consumption ; firstly, as already indicated, the Food Standards (Soft Drinks) Order provides for a drink made from not less than 5½ per cent. of whole fresh orange, secondly, the same Order provides for a drink containing not less than five per cent. of orange juice, lastly, pure undiluted orange juice may be marketed. It is obviously important that a purchaser should be left in no doubt as to which of these he is being offered and the Labelling of Food Order does, in fact, require the packer to apply a correct label to the food. In the above instances the labels bore either no name or such descriptions as " Morning Orange," " Orange ready to Drink," " Morning Fruit Drink," etc. ; descriptions which in no way indicate to a purchaser which of the three types of orange drink is being offered to him. The packers of each of these samples were communicated with and informed of the requirements of the Labelling of Food Order. As a result of this unsatisfactory position, and following representations from one of the Autonomous Food and Drugs Authorities, the Public Health and Housing Committee in October of the year under review resolved to refer the matter to the County Councils Association with a view to representations being made to the Ministry of Food for an amendment of the appropriate Order to require a specific statement of the nature of the various orange drinks to appear on the label and to require a minimum orange or orange juice content to be present in the drink and also declared on the label.

Although fruit juices do not come within the provisions of the Food Standards (Soft Drinks) Order it is convenient to mention them here in that during the year 1954 several samples submitted as fruit juices were found upon analysis to consist only of soft drinks containing a relatively small proportion of actual fruit juice. In all, 11 samples (eight County) were submitted under this heading and of these eight (five County) were reported upon adversely. One of the County samples No. E.2563, consisted of canned orange juice which contained an excessive amount of tin and the remainder of the stock was surrendered for destruction. The remaining seven samples although submitted as orange juice or pure fruit juice actually consisted of soft drinks containing between 4·6 and 14·0 per cent. of orange. In respect of two of these samples, Nos. S.1582 and S.2055, successful prosecutions were instituted under the Defence (Sale of Food) Regulations and in respect of a third sample successful legal proceedings were also instituted by an Autonomous Authority under the Defence (Sale of Food) Regulations and under the Labelling of Food Order.

Gelatine.

Edible gelatine is a food for which standards are prescribed in the Food Standards (Edible Gelatine) Order, 1951. The British Pharmacopoeia 1953 contains a monograph on gelatine intended for medicinal purposes and this also contains standards. The standards for edible gelatine prescribed by the Order are as follows :—

> " Edible gelatine shall be clean wholesome protein which—
>
> (*a*) is obtained by extraction from collagenous material ;
>
> (*b*) is free from objectionable taste and offensive odour ;
>
> (*c*) dissolves completely in warm water to give a clear or translucent colloidal solution which sets to a jelly when cooled to and maintained at 60° F ;
>
> In the case of edible gelatine sold, offered or exposed for sale by retail at three per cent. solution shall set as aforesaid ;
>
> Provided that where edible gelatine sold, offered or exposed for sale by retail is clearly and conspiciously described as being of low setting strength on a label (which includes directions for use) marked on or securely attached to the wrapper or container in which it is sold, offered, or exposed for sale, a solution made up in accordance with the directions for use shall be set as aforesaid ;
>
> (*d*) yields not more than 3·25 per cent. by weight of ash ;
>
> (*e*) contains in each million parts by weight not more than two parts by weight of arsenic (expressed as arsenic), seven parts by weight of lead, 30 parts by weight of copper, 100 parts by weight of zinc."

In addition, the Public Health (Preservatives, etc., in Food) Regulations 1925 to 1935 permit gelatine to contain up to 1,000 parts per million of sulphite preservative expressed as sulphur dioxide.

The standards of the British Pharmacopoeia are identical to the above in respect of the maximum limits for ash, arsenic, lead, copper, zinc and sulphur dioxide. In addition, the Pharmacopoeia prescribes a maximum loss on drying of not more than 16·0 per cent. and makes the requirement of freedom from objectionable taste and offensive odour more specific by applying it to a warm five per cent. w/v solution. On the other hand, the Pharmacopoeia does not prescribe conditions for the setting test, but simply requires a solution in hot water to form a jelly on cooling.

During the year under review there has been one suggested alteration to the above standards in that the Food Standards Committee of the Ministry of Food in their revised recommendations for limits for the lead contents of foods, recommends that the limit for lead in edible gelatine should be reduced to five parts per million.

During the year 1954, eight samples of gelatine were submitted for examination, all by County Sampling Officers, and of these two (Nos. N.1552 and N.1658), both obtained from the same shop, were reported upon adversely. In both instances the samples complied with the limit tests for metallic impurities, etc., but it was found that a three per cent. solution would not set under the condition laid down in the Food Standards Order. In view of its unsatisfactory setting qualities the remainder of this particular stock was destroyed.

MARGARINE.

Margarine was derationed on the 8th May during the year under review and following that two important changes were made in its composition. The first is that two months after rationing ceased margarine was no longer permitted to contain boron preservative. This followed from the amendment introduced in clause 2 (e) of the Public Health (Preservatives, etc., in Food) (Amendment) Regulations, 1953. The second change in composition was due to the making of the Food Standards (Margarine) Order, 1954, which came into operation on the 16th May, 1954. The Order applies only in respect of sales by retail but to both imported and home-produced margarine. A sale by retail includes a sale of margarine as such by a caterer but does not include a sale to a caterer for the purpose of his catering business or a sale to a manufacturer for the purpose of his manufacturing business. The standard prescribed by the Order is given in the First Schedule and refers to Vitamin A and Vitamin D content of margarine and is as follows :—

" Each ounce of margarine shall contain—

(*a*) not less than 760 international units and not more than 940 international units of vitamin A determined in accordance with the method set forth in the Second Schedule to this Order.

> The vitamin A content shall be calculated as the sum of the vitamin A present as such or as its esters plus 0·8 times the beta-carotene equivalent of any carotenes present; any alpha-carotene being considered as equivalent in potency to half its weight of beta-carotene; and when red palm oil is used as a source of carotenes, the beta-carotene equivalent shall be taken as 53·5 per cent. of the total carotenes;
>
> (*b*) not less than 80 international units and not more than 100 international units of vitamin D."

The amount of vitamin D now required to be present is approximately the same as that previously required to be present (90 i.u. per ounce) under the terms of manufacturing licenses in the days of control but the amount of vitamin A now prescribed is higher than in the days of control when it was limited to 450 to 550 i.u., per ounce. The present standard has resulted in the vitamin A content of margarine being raised to the average vitamin A content of butter.

The Standards Order not only prescribes the standard but it also, in the Second Schedule, prescribes the method by which the vitamin A content is to be determined and calculated. The method laid down is quite intricate and it will be sufficient to state here that it depends on the separation of carotene (pro-vitamin A) and vitamin A in the unsaponifiable matter of the margarine by a process of double column chromatography. The optical density of the carotene solution is measured in a spectrophotometer over the wavelengths 440 to 450 m.u., while the optical density of that portion of the eluate containing the vitamin A (which is identified colorimetrically by the Carr–Price reaction) is measured at the wavelength showing maximum absorption which is usually at 324 m.u. The total vitamin A potency of the margarine is then obtained from the sum of the B-carotene equivalent multiplied by 0.8 plus the actual vitamin A present (calculated on the basis that a one per cent. solution of pure vitamin A alcohol in a l c m . cell has a density of 1,830 at the wavelength of maximum absorption).

In view of the fact that the determination of vitamin D can, as yet, only be satisfactorily carried out by a very time-consuming and expensive biological assay no method for its determination has been included in the Order. Agreement has been reached, however, between the Ministry of Food and manufacturers in this country that the vitamins will be added to margarine through the medium of a master mix in which the proportions of vitamins A and D are in the ratio of 940 : 100. A satisfactory vitamin A determination will, therefore, also be indicative of the presence of the correct amount of vitamin D.

It should also be mentioned that in common with the procedure for other Food Standards Orders legal proceedings may now be instituted by Food and Drugs Authorities in respect of samples of margarine deficient in vitamins without the consent of the Minister of Food. Prior to the making of the Food Standards (Margarine) Order control of the vitamin content of margarine was exercised solely by the Ministry of Food in that inclusion of specified amounts of vitamins A and D was a condition of the issue of a manufacturing licence.

During the year under review 28 samples (22 County) of margarine were examined for vitamin A content. Of these one sample No. S.3458, submitted by a County Sampling Officer, was found to have a vitamin A content of only 595 international units per ounce against the minimum requirement of 760 international units per ounce. This sample was an imported product and both the importers and the manufacturers were communicated with. The manufacturers gave an assurance that steps would be taken to prevent a recurrence of this deficiency in future. In addition, a sample of margarine submitted by an Autonomous Authority was found to contain only 420 international units of vitamin A per ounce. It transpired that this sample was of old stock and that complaints with regard to its flavour had also been received. The remainder of the stock was withdrawn from sale.

BORIC ACID OINTMENT.

Several changes have occurred in the composition of this official ointment since the year 1932. The British Pharmacopoeia of that year specified that it should consist of 10 per cent. boric acid in white paraffin ointment. The Sixth Addendum to the B.P. published in the year 1943, altered its composition to one per cent. of boric acid in hydrous ointment while the Seventh Addendum published at the beginning of the year 1945 stipulated that it should contain one per cent. of boric acid in white paraffin ointment. The last mentioned formula, but with the inclusion of cetostearyl alcohol in the paraffin ointment, is included in the British Pharmacopoeia 1953. The monograph in the Pharmacopoeia includes an official assay and also prescribes limits for the boric acid content (*viz.*, 0·9 to 1·1 per cent.).

During the year 1954 the County Sampling Officers submitted 22 samples of boric acid ointment for examination and of these only two were reported upon adversely. Informal sample No. N.1385 was found upon analysis to contain 9·4 per cent. of boric acid in paraffin ointment and consisted, therefore, of boric acid ointment B.P. 1932. It is now 12 years since this formula was discontinued yet in correspondence, while it was admitted that this was the last tin of some very old stock, the vendor stated that he had not realised that the standard had changed. The remaining unsatisfactory sample No. E.3244, was found to contain

11·0 per cent. of boric acid and had also been compounded in accordance with the formula of the B.P. 1932. In this instance the vendor agreed to withdraw the remainder of the stock from sale.

CAMPHORATED OIL.

For many years now the British Pharmacopoeia has required camphorated oil to contain 20 per cent. of camphor but, due to changing conditions mainly brought about by the last world war, the nature of the oil in which the camphor is dissolved has been altered twice within the last 15 years. In the British Pharmacopoeia 1932, the composition of camphorated oil was specified to be 20 per cent. by weight of camphor in olive oil. Soon after the beginning of the war, in June, 1940, the Second Addendum of the Pharmacopoeia permitted arachis oil, cottonseed oil or seasame oil to be used in place of olive oil. This position continued until the publication of the British Pharmacopoeia, 1938, when the composition of camphorated oil was declared to be 20 per cent. by weight of camphor in arachis (ground nut) oil. This last formula has also been included in the British Pharmacopoeia, 1953 ; the limits for camphor content being fixed at 19·0 to 21·0 per cent. w/w.

During the year 1954, 34 samples of camphorated oil were submitted for examination, all by County Sampling Officers, and of these three were reported upon adversely. Informal sample No. C.911 was found to contain only 18·5 per cent. of camphor, which is 0·5 per cent. less than the minimum B.P. limit. The manufacturers were communicated with and they undertook to see that in future their product would comply with the requirements of the B.P. Informal sample No. E.3357 was also found to be slightly deficient in camphor, its camphor content being 18·4 per cent. In this case it was ascertained that the sample was old stock and that the manufacturers concerned were no longer making camphorated oil. The remaining unsatisfactory sample, No. S.2552, had a correct camphor content, but it had not been prepared with arachis oil. The oil present was of the nature of olive oil which has not been permitted as an ingredient of camphorated oil since the year 1948. In this instance also it transpired that the sample was old stock and that the manufacturers had ceased to make camphorated oil. The remainder of this stock was withdrawn from sale.

COD LIVER OIL, EXTRACT OF MALT AND EXTRACT OF MALT WITH COD-LIVER-OIL.

The above commodities are the subjects of monographs in the British Pharmacopoeia but they are also foods and may, therefore, come within the labelling requirements of both the Labelling of Food Order and the Pharmacy and Medicines Act as well as having to comply with the standards of the B.P. This point, however, has been the subject of the following rulings :— (1) the definition of " food " in the Food and Drugs Amendment Act, 1954, only excludes those drugs which are " articles or substances used only as drugs." (2) The Ministry of Food ruled, as far back as the year 1944, that Cod Liver Oil and Extract of Malt with Cod Liver Oil were not subject to the requirements of the Labelling of Food Order provided that no claim or indication was given that the products were foods. (3) The First Report of the Definition of Drugs Joint Sub-Committee of the Standing Medical, Pharmaceutical and General Practitioner Advisory Committees made to the Minister of Health in 1950, for the guidance of general practitioners when prescribing drugs, stated that Cod-Liver Oil and Extract of Malt with Cod-Liver Oil may be regarded as drugs when used for the treatment, for example, of tuberculosis or vitamin deficiency but were to be regarded as foods when used as a routine measure for healthy persons. The British Pharmacopoeia uses the description " Extract of Malt with Cod-Liver Oil " and thereby follows the normal requirement of the Labelling of Food Order that the ingredient present in the greater proportion, *i.e.* " Extract of Malt," should be named first. This was the practice in the British Pharmacopoeia long before the Labelling of Food Order was made ; yet, in two of the rulings to which reference is made above this product is described as ' Cod-Liver Oil and Malt " and " Cod-Liver Oil and Malt Extract."

With regard to Standards, the British Pharmacopoeia requires Cod-Liver Oil to contain not less than 600 units of Vitamin A activity per gram. and not less than 85 units of Vitamin D per gram. It is interesting to note that the 1953 Pharmacopoeia requires the assay of Vitamin A to be carried out by a spectrophotometric method only ; whereas the 1948 Pharmacopoeia gave both a biological and a spectrophotometric method for this assay, the spectrophotometric assay then being regarded as subsidiary to the biological assay. Extract of Malt of the Pharmacopoeia is required to contain Nitrogen equivalent to 4.0 per cent. w/w of protein and to pass a limit test for Lipase. Extract of Malt with Cod-Liver Oil must contain 10·0 per cent. w/w of Cod-Liver Oil (limits 9·3 to 10·7) and both its ingredients should, of course, be of B.P. quality. It should be noted, however, that while the maximum limit for the acid value of cod-liver oil, per se, is 1·2, the limit for the acid value of the oil obtained in the assay of Extract of Malt with Cod-Liver Oil can be as high as 10.

During the year 1954 10 samples of Cod-Liver Oil, five samples of Malt Extract and eight samples of Malt Extract with Cod-Liver Oil were submitted for examination. With the exception of one sample of Cod-Liver Oil all the above were submitted by County Sampling Officers. The only sample reported upon adversely was an informal sample of Malt Extract with Cod-Liver Oil, No. C.2570, which although satisfactory in its Cod-Liver Oil content, was found to contain only 3·3 per cent. w/w of protein. This figure corresponded to an original protein content in the Extract of Malt used of only 3·7 per cent. ; whereas, as indicated above, the protein content of the extract of malt should not be less than 4·0 per cent. In your Analyst's experience it is only very occasionally that a sample of malt extract is found to be deficient in protein and this would also appear to be the experience of the manufacturers of this particular product who, at first, expressed surprise at the result we had obtained. After however, they had had an opportunity of corroborating the result on a portion of the same sample they gave an assurance that steps would be taken to render it most unlikely that any similar deficiency would occur in the future.

TINCTURE OF IODINE.

Weak solution of Iodine or, as it is usually called, tincture of Iodine is the preparation of Iodine commonly used as an emergency antiseptic for application to small wounds. The present limits for this preparation laid down in the British Pharmacopoeia, 1953, and those previously specified in the B.P. 1948 and in the B.P. 1932 are compared below :—

	B.P. 1948 and B.P. 1953.	B.P. 1932.
Iodine	2·45—2·55% w/v	2·45—2·55% w/v
Potassium Iodide ...	2·45—2·55% w/v	1·45—1·55% w/v.
Alcohol	85—88% v/v	85—88% v/v

In addition to the above preparation the British Pharmacopoeia, 1953, includes a strong solution of Iodine with 10 per cent. of Iodine and also an aqueous solution of Iodine containing five per cent. of Iodine. Tincture of Iodine is made up with ethyl alcohol and distilled water but industrial methylated spirits (acetone free) can be used in the preparation of iodine paint intended for external use only subject to the observance of conditions laid down by the Board of Customs and Excise.

During the year under review 10 samples of tincture of iodine were examined in the County Laboratory. Nine of the samples were submitted by County Sampling Officers and, of these, three were reported upon adversely. Informal sample No. 1970 was found to contain 2·61 per cent. of iodine which is 0·06 per cent. above the maximum B.P. limit ; in view of the small excess found no action was taken in respect of this sample. Informal samples Nos. N.1967 and N.2111 were both obtained from the same Pharmacist's shop and they were both found to contain an excess of iodine and of potassium iodide. Sample No. N.1967 contained 2·68 per cent. iodine and 2·75 per cent. potassium iodide, figures which are 0·13 per cent. and 0·20 per cent. above the maximum B.P. limits respectively. Sample No. N.2111, which was obtained subsequently from the shop, was found to contain an excess of 0·13 per cent. in respect of both its iodine and potassium iodide contents. Following correspondence with the vendor it transpired that this tincture of iodine had been compounded on the premises and, while the Pharmacist was satisfied that it had been prepared from correct quantities of materials in the first place, it did appear that there was a possibility that some loss of solvent had occurred during storage which could, of course, account for the analytical results obtained. The Pharmacist was asked to take steps to prevent any discrepancies of this kind occurring in future.

PENICILLIN PREPARATIONS.

Amorphous penicillin of the British Pharmacopoeia occurs as the calcium salt, the potassium salt or the sodium salt. It consists of a mixture of penicillins of which five predominate and of these Benzylpenicillin is the most important in that it is this form which is required to be dispensed or supplied when " Penicillin " is prescribed. Benzylpenicillin (Crystalline Penicillin G) is supplied as the crystalline potassium or sodium salt which had has impurities and salts of other penicillins removed as completely as possible. In addition to the above, a compound of Benzylpenicillin, *i.e.*, Procaine Benzylpenicillin is also included in the British Pharmacopoeia. This salt of penicillin is sparingly soluble and it is used when it is necessary to release penicillin slowly over a longer period than usual into the blood stream.

The official preparations of the British Pharmacopoeia which are made from either Amorphous Penicillin or Benzylpenicillin include a cream, an eye ointment, an injection, a lozenge and an ointment. Tablets are made only from Benzylpenicillin. The two preparations of Procaine Benzylpenicillin official in the British Pharmacopoeia are an injection and another injection containing both Procaine Benzylpenicillin and Benzylpenicillin. In addition to the above the British Pharmaceutical Codex lists solution-tablets containing either Amorphous Penicillin or Benzylpenicillin, a sterilised cream containing Benzylpenicillin and eye-drops of Benzylpenicillin.

The official assays of Benzylpenicillin are carried out by chemical methods but the determination of the potency of Amorphous Penicillin, Procaine Benzylpenicillin and certain of the preparations of penicillin is carried out by a micro-biological method using a susceptible strain of B. subtilis and comparing the dose of the sample with the dose of a standard preparation of penicillin which produces the same degree of inhibition of the micro-organism. The potency is returned in terms of units of penicillin. The unit at present in use being the specific activity contained in 0·0005988 mg. of the Standard Preparation of the dried crystalline sodium salt of Benzylpenicillin. TheBritish Pharmacopoeia directs that penicillin and its water-free preparations should be stored in sealed or well-closed containers, protected from moisture and kept cool. Warning is given that the cream and injection of penicillin, which of course contain water, deteriorate rapidly in potency on keeping.

During the year under review 11 samples of penicillin preparations were examined by the micro-biological method of assay ; these consisted of two samples of lozenges of penicillin B.P., two of ointment of Penicillin B.P. and seven of tablets of Penicillin B.P. The British Pharmacopoeia requires that these preparations should contain, unless otherwise specified, 1,000 units per lozenge, 1,000 units per gram. of ointment and 200,000 units per tablet respectively. In each instance the potency found is required to be not less than 90 per cent. of the declared or prescribed number of units. Nine of the 11 samples were found to be satisfactory but the remaining two informal samples of tablets of penicillin (Nos. C.2134 and C.2178), both obtained from the same pharmacist's shop, were found upon examination to contain only 130,000 units and 105,000 units of penicillin per tablet respectively, instead of 200,000 units. The second sample was taken as a result of the unsatisfactory assay obtained on the first and both were supplied by the vendor in small cardboard cartons which were by no means air tight or moisture proof. The vendor was communicated with and it transpired that the tablets in question were several months old and had been stored in bulk in a container which had allowed access of atmospheric moisture. The remainder of the stock was withdrawn from sale and returned to the makers.

PROSECUTIONS.

When the adulteration of a sample is considered to be sufficiently serious, legal proceedings are instituted. Prosecution, however, is only one of the means of dealing with adulterated or otherwise unsatisfactory samples. A perusal of tablets 11 and 24, which are concerned with the various types of milk adulteration and sophisticated samples other than milk, respectively, shows that many of the samples are only slightly adulterated. In the case of food and drug samples, other than milk, deterioration may be due to long storage or adulteration may be brought about by the action of some person other than the actual vendor. In these instances it is often considered appropriate to take less drastic action than legal proceedings. In the case of milk samples vendors are sometimes cautioned and subsequent samples then frequently prove to be genuine ; in other instances dairies are visited by the Sampling Officers in order to correct faulty dairy management which has given rise to unsatisfactory samples. In the case of other foods and drugs appropriate action may take the form of the surrender for destruction of the remainder of any unsatisfactory stocks, returning stocks to manufacturers or communicating with packers with regard to unsatisfactory labels, etc.

During the year a total of 417 County food and drugs samples were reported upon adversely and in respect of 44 of these prosecutions were instituted, 39 in respect of milk samples, two in respect of orange juice, one in respect of pork sausages, one in respect of ice-cream and one in respect of whisky. In addition there was one prosecution under section 19 of the Food and Drugs (Milk Dairies and Artificial Cream) Act in respect of two samples of raw undesignated milk sold in a specified area in the County. There were 45 convictions or orders to pay costs. The total fines and costs during the year amounted to £294 9s. 6d. a figure which is the lowest since the year 1944. In table 26 will be found similar information to the above for the years 1912 to 1954 inclusive.

Table 26.

County Fines and Costs during the Years 1912–1954.

Year.	Number of Prosecutions.	Convicted or ordered to pay costs.	Dismissals, etc.	Fines and Costs. £	s.	d.
1912–1935 ...	1504	1302	202	6,239	1	7
1936 ...	22	20	2	107	14	9
1937 ...	39	36	3	165	1	0
1938 ...	26	24	2	132	10	1
1939 ...	19	18	1	100	11	6
1940 ...	25	23	2	171	14	0
1941 ...	84	79	5	824	13	2
1942 ...	38	36	2	502	4	10
1943 ...	54	49	5	375	10	11
1944 ...	38	37	1	291	19	6
1945 ...	33	33	0	365	4	6
1946 ...	94	92	2	936	7	9
1947 ...	98	93	5	667	7	0
1948 ...	70	69	1	703	0	6
1949 ...	48	45	3	518	17	2
1950 ...	43	42	1	405	8	7
1951 ...	50	39	11	362	11	6
1952 ...	65	64	1	620	13	0
1953 ...	54	53	1	576	12	8
1954 ...	45	45	0	294	9	6
Total ...	2,449	2,199	250	14,361	13	6

Table 27.

Prosecutions arising out of Samples purchased during the year 1954.

District.	Number of Prosecutions.	Convicted or ordered to pay costs.	Dismissals, etc.	Fines and Costs. £	s.	d.
Bacup Borough	1	1	...	12	2	0
Clitheroe R.D.C.	5	5	...	10	19	6
Crompton U.D.C.	6	6	...	84	14	0
Failsworth U.D.C.	5	5	...	42	13	0
Fylde R.D.C.	1	1	...	14	4	0
Heywood Borough	2	2	...	14	4	0
Littleborough U.D.C. ...	5	5	...	15	18	0
Longridge U.D.C.	10	10	...	24	10	0
Preesall U.D.C.	1	1	...	1	5	0
Ramsbottom U.D.C. ...	1	1	...	12	7	0
Royton U.D.C.	1	1	...	6	4	0
Ulverston R.D.C.	1	1	...	6	4	0
Wardle U.D.C.	2	2	...	10	5	0
West Lancs. R.D.C.	2	2	...	18	9	0
Westhoughton U.D.C. ...	1	1	...	9	5	0
Whiston R.D.C.	1	1	...	11	6	0
County Districts	45	45	...	294	9	6
Autonomous Authorities ...	3	3	...	29	8	0
Total all Sources	48	48	...	323	17	6

PART II.—THE MILK (SPECIAL DESIGNATION) (PASTEURISED AND STERILISED MILK) REGULATIONS, 1949 TO 1953.

Phosphatase Test, Half-hour Methylene Blue Test and Turbidity Test.

The above Regulations applying to heat-treated milk (as distinct from other Regulations relating to raw milk) were made jointly by the Minister of Health and the Minister of Food. The Regulations, besides relating to pasteurised milk, also provide for the special designation " sterilised milk."

The special designations for heat-treated milk are " Pasteurised " and " Sterilised " but in appropriate circumstances the designations " Tuberculin Tested Milk (Pasteurised) " and " Tuberculin Tested Milk (Sterilised) " may also be used.

Food and Drugs Authorities are responsible for the granting of pasteurising and sterilising licences but Local Authorities are responsible for all other licences required by the Regulations. The duties of Food and Drugs Authorities include the inspection of records, the inspection of the arrangements for processing milk and the taking of samples in respect of all plants for which licences have been granted.

An amendment to the Milk (Special Designation) (Pasteurised and Sterilised Milk) Regulations which came into operation on the 20th December, 1953, required the compulsory use of overlapping caps on all containers of pasteurised milk from the 1st October, 1954. It will be remembered that this same date was fixed in the principal Regulations for the operation of the requirement that pasteurised milk must be put into the containers in which it is to be delivered to customers on the premises at which it has been pasteurised. It follows from this that the bottling of pasteurised milk from churns by retailers and the sale of pasteurised milk by measure from a can are now both illegal. The amending Order also permits sterilised milk to be processed in cans and other containers of a capacity of not more than one gallon as well as in bottles.

Pasteurised milk must be treated by one or the other of the following processes :—

(*a*) Retained at a temperature of not less than 145°F. and not more than 150°F. for at least 30 minutes and be immediately cooled to a temperature of not more than 50°F. ; or (*b*) Retained at a temperature of not less than 161°F. for at least 15 seconds and be immediately cooled to a temperature of not more than 50°F. ; or

(*c*) Retained at such temperature for such period as may be specified by the licensing authority with the approval of the Minister.

It will be noted that the temperature of 161°F given in (*b*) is 1°F lower than that originally specified ; the Minister of Food stated that this change would improve the " cream line " of the milk without, on present evidence, causing any risk to health.

Sterilised milk must be filtered or clarified, homogenised and heated to and maintained at such a temperature, not less than 212°F., for such a period as to ensure that it will comply with the turbidity test prescribed.

The Regulations state that samples may be taken at any time while the milk is in the possession of the processor or of the licensed dealer. Unopened bottles should be taken as samples where possible but where the milk is in bulk (exceeding 1 quart) it may be sampled into sterile bottles. All samples must be carried in insulated containers (not artificially cooled) and they must arrive at the laboratory on the day of sampling.

Three tests are prescribed, a phosphatase test and half-hour methylene blue test for pasteurised milk and turbidity test for sterilised milk. Samples intended for examination by the phosphatase test must be stored in the laboratory at a temperature of between 32°F and 40°F while samples intended for the methylene blue test must be stored at the laboratory at an atmospheric shade temperature not exceeding 65°F. No storage temperature is prescribed for samples of sterilised milk.

The phosphatase test depends on the liberation of free phenol from the salt disodium phenyl phosphate by the enzyme phosphatase. This enzyme is always present in raw milk but is almost entirely destroyed by the amount of heat-treatment necessary for efficient pasteurisation, *i.e.*, necessary for the destruction of m-Tuberculosis and other pathogenic micro-organisms. The amount of phenol liberated in the test is an approximate but not directly proportionate measure of the phosphatase remaining in the milk ; a high result indicating insufficient heat-treatment or the presence of raw milk. The test is extremely delicate and it is essential that great care be exercised in collecting the samples for submission to the test, in testing the purity of the reagents used and in the actual carrying out of the test.

The methylene blue test depends on the decolorisation of methylene blue by bacteria and reducing substances present in milk. If under the conditions of the test, decolorisation occurs in less than 30 minutes it is deemed that there has been such a development of bacteria and reducing substances in the milk as to render its keeping quality unsatisfactory. The test is designed to ensure that milk will keep fresh, if kept reasonably cool, until the next day's supply is received by the consumer and with that end in view samples, before examination in the laboratory, are not kept in a refrigerator but are merely kept at atmospheric shade temperature not exceeding 65°F. It should be noted that the half-hour methylene blue test prescribed by these Regulations is quite different from the methylene blue test prescribed in the Milk (Special Designation) (Raw Milk) Regulations, 1949, in relation to raw designated milks.

The turbidity test for sterilised milk is based upon the fact that heating to not less than 212°F for a period sufficient for effective sterilisation will also completely denature all the soluble protein of the milk. Samples which show the presence of soluble protein under the conditions of the test are insufficiently heated or contain raw milk.

The Milk (Special Designations) (Specified Areas) Orders 1952 to 1954.

It will be recalled that following the publication of a government memorandum on Measures to Improve the Quality of the Nations Milk Supply the Minister of Food was given power under Regulation 55 G of the Defence (General) Regulations, dated 20th January, 1944, to restrict the sale of raw milk within any area which had been specified for that purpose in an Order made by the Minister. Before an area could be made a specified area it was, of course, necessary for the Minister to satisfy himself that adequate plant was available for heat-treating the whole of the milk sold within the area, with the exception of Tuberculin Tested Milk and certain Accredited Milk. Similar provisions to the above were included in the Milk (Special Designations) Act, 1949, and Regulation 55 G was then revoked. This Act was, in turn, repealed and replaced by the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, which came into operation on the 1st January, 1951, and which also consolidated certain other enactments. Section 19 of this Act makes it compulsory to use a special designation in respect of all sales of milk by retail for human consumption in an area which has been designated by Order as a Specified Area. The only exceptions refer to catering sales and to the sale of milk by a producer to his employees, if, in the latter instance, he does not engage in any other selling of milk by retail. Section 23 of the same Act empowers the Minister of Food to bring into operation by Order the provisions of Section 19 in any area. The special designations which may be used in relation to heat-treated milk in a Specified Area are "Pasteurised," "Sterilised," "Tuberculin Tested Milk (Pasteurised)" and "Tuberculin Tested Milk (Sterilised)." In relation to raw milk the special designation now permitted is "Tuberculin Tested." The use of the special designation " Accredited " on and after the 1st October, 1954 was prohibited in specified areas by Section 22 of the Food and Drugs (Milk Dairies and Artificial Cream) Act, 1950. During the year 1952 the Minister of Food acting under the powers mentioned above made the Milk (Special Designations) (Specified Areas) Order, 1952 ; the Schedule to which enumerates five specified areas, part of one of which comes within the area of the County Food and Drugs Authority. This Order came into operation on the 1st November, 1952. On the 17th December, 1953, and on the 10th September, 1954, the Minister made a further Specified Area Order affecting parts of the County which came into operation on the 1st January, 1954 and the 1st October, 1954, respectively. In view of the fact that it is the duty of the Food and Drugs Authority to enforce the provisions of Section 19 of the Act, samples of special designation heat-treated milks are now being taken in the County Districts concerned and submitted to the County Laboratory for examination by the usual Statutory Phosphatase, half-hour Methylene Blue or Turbidity tests. In this connection it is interesting to note that a successful prosecution was instituted during the year under review under Section 19 of the Food and Drugs (Milk, Dairies and Artificial Cream) Act in respect of two samples (Nos. 4557 and 4558) of raw undesignated milk sold in a Specified Area in the County.

During the year, 1,021 samples of milk were submitted for examination by the phosphatase test and the half-hour methylene blue test or by the turbidity test. The samples were marked either Pasteurised, Tuberculin Tested (Pasteurised) or Sterilised and tables 28, 29 and 30 give particulars of the results obtained. In addition five control samples of raw milk were submitted for examination by the phophatase test and, as was to be expected, these samples failed to pass the test. As already mentioned two samples of raw undesignated milk sold in a specified area in the County were also examined by the phosphatase test and the half-hour methylene blue test. Both these samples gave results by the phosphatase test which were typical of those given by raw milk.

With regard to the methylene blue test the Regulations prescribe that it shall be commenced between 9 a.m. and 10 a.m. on the day after the sample was taken and that in the meantime as already indicated it shall be kept at the laboratory at atmospheric shade temperature not exceeding 65°F (the sample must not be kept in a refrigerator). During periods of exceptionally warm weather the shade temperature often exceeds the limit specified. Of the numbers reported as unsatisfactory in table 29, six samples, submitted by County Sampling Officers, and one submitted by an Autonomous Authority were kept at shade temperatures exceeding 65°F. and these, therefore, should be deducted from the total number of unsatisfactory samples to arrive at the number failing to pass the statutory test. It should be mentioned, however, that even when the shade temperature exceeds 65°F. a considerable number of samples will still pass the test ; in view of the fact that keeping quality is particularly desirable in warm weather it is unfortunate that the statutory test cannot then be applied. With regard to the turbidity test it will be observed from table 30 that all samples of sterilised milk satisfactorily passed the test.

Table 28.

Phosphatase Tests, 1954.

Type of Milk.	Number Submitted.		Number Unsatisfactory.					
			County.			Borough.		
	County.	Borough.	Group II.	Group III.	Total	Group II.	Group III.	Total.
Pasteurised ..	565	98	6	3	9	0	0	0
T.T. (Pasteurised)	230	27	1	0	1	0	0	0
Raw Milk	7	0	0	0	0	0	0	0
Totals ..	802	125	7	3	10	0	0	0

Table 29.

Half-hour Methylene Blue Tests, 1954.

Type of Milk.	Number Submitted.		Number Unsatisfactory.	
	County.	Borough.	County.	Borough.
Pasteurised	563	97	9	1
T.T. (Pasteurised) ..	230	27	1	0
Raw Milk	2	0	0	0
Totals	795	124	10	1

Table 30.

Turbidity Tests, 1954.

Type of Milk.	Number Submitted.		Number Unsatisfactory.	
	County.	Borough.	County.	Borough.
Sterilised	72	31	0	0
T.T. (Sterilised) ..	0	0	0	0
Totals	72	31	0	0

PART III.—THE EFRTILISERS AND FEEDING STUFFS ACT, 1926.

The Fertilisers and Feeding Stuffs Act, 1926, came into force on July 1st, 1928. It is intended to safeguard the purchasers of substances used for the fertilisation of the soil and for the feeding of cattle and poultry.

The general purpose of the Act, like that of the Act of 1906, which it repealed, is to provide civil remedies for the misdescription of, and to prevent fraud in, fertilisers and feeding stuffs. Its scope is defined by Regulations made by the Minister of Agriculture and Fisheries.

In addition, during and since the war, a number of Regulations governing the control and composition of fertilisers and feeding stuffs were made by appropriate Government Departments. In this connection, however, the Minister of Food made, in the year 1953 the Feeding Stuffs (Revocation) Order which came into operation on the 1st August, 1953. The effect of this Order was to revoke all Orders made under the Defence (General) Regulations, 1939, which were concerned with the control of the manufacture, licensing, rationing and prices of Feeding Stuffs. The only statutory control of the composition of Feeding Stuffs now in operation is, therefore, that exercised under the Fertilisers and Feeding Stuffs Act, 1926.

Fifty-one samples have been examined for the County during the year under review. The number of County samples, therefore, has been maintained at the level reached over the previous five years. Of these 17 were fertilisers and 34 consisted of feeding stuffs. The fertilisers comprised nine formal samples and eight informal samples. The feeding stuffs consisted of 32 formal and two informal samples.

In addition 11 informal samples (eight fertilisers and three feeding stuffs) were examined for an Autonomous Authority.

Of the 17 samples of fertilisers examined for the County 13 were found upon analysis to be correct within the limits of variation permitted by Regulations made under the Act and four showed minor deviations outside the permitted limits of variation. The copies of the Statutory Statements as to composition which accompanied three samples, No's 5/11/A General Potato Fertiliser, 3/10/B Bone Meal and 10/11/A Ground North African Phosphate were not strictly in the form prescribed by the Act although the particulars therein in relation to the samples of General Potato Fertiliser and Bone Meal were correct within the limits of variation. The remaining sample No. 10/11/A Ground North African Phosphate, in addition, showed a minor deviation in composition outside the permitted limits of variation and is included in the four samples mentioned above.

It should, however, be noted here that during the years 1953 and 1954 in exercise of powers under Section 2 of the Theraputic Substances (Prevention of Misuse) Act, 1953, Regulations have been made by the

Minister of Health which permit the use of certain antibiotics, *viz.*, penicillin, aureomycin and oxytetracycline, in pig foods and poultry foods. The Regulations prescribe conditions with regard to labelling and also specify a maximum limit for the amounts of the prescribed antibiotics which may be present.

With regard to the 34 samples of feeding stuffs examined for the County, 22 were found to be correct within the permitted limits of variation. In 11 other instances minor deviations only from the guaranteed figures were found. The remaining sample, No. 7/10/A Superbalanced Dairy Meal, Coarse, showed an excess in its Fibre content, after allowing for the limits of variation, of 2·0 per cent. This excess in the opinion of your Analyst might be to the prejudice of the purchaser and the matter was referred to the Authority in whose area the premises of the manufacturer are situated.

In tables 31 and 32 will be found particulars of all the samples of fertilisers and feeding stuffs respectively examined for the County. The tables include the results obtained on analysis and for comparison, the figures guaranteed in Statutory Statements, etc. It will be noted that two samples No's 4/8/A Baconer Meal with antibiotic and 1/9/A Calf Pencils with added vitamins were examined for their content of aureomycin hydrochloride and vitamin A respectively.

Table 31.

Composition of Fertilisers, 1954.

Sample Number, District and Description.	Formal or informal.	Per cent. Nitrogen.		Per cent. Phosphoric Acid (P_2O_5).						Per cent. Potash. K_2O.		Other Figs. per cent.
				Soluble.		Insoluble.		Total.				
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
1/4/B Blackburn Lower—General Fertiliser ..	I	7·0	6·55	6·0	6·4	1·0	0·8		7·2	7·0	7·0	
2/4/5 Blackburn Lower—99·9 Soluble Blood Manure	I	13·5	12·8									
1/3/B Kirkham—Nitro Chalk Fertiliser ..	I	15·5	15·2A									
2/3/B Kirkham—Horticultural Steamed Bone Meal ..	I	0·82	3·1					23·62	27·0			
4/11/A Widnes—Chrysanthite ..	F	6·5	6·8	5·0	4·54	4·0	3·80		8·34	5·0	5·0	B

Table 31—continued.

Sample Number, District and Description.	Formal or informal.	Per cent. Nitrogen.		Per cent. Phosphoric Acid (P_2O_5). Soluble.		Insoluble.		Total.		Per cent. Potash. K_2O.		Other Figs. per cent.
		G.	F.	G.	F.	G.	F.	G.	F.	G.	F.	
5/11/A Widnes—General and Potato Fertiliser . .	F	6·0	5·8	8·25	8·25		0·80	9·0	9·05	6·0	5·5	
3/10/B Seaforth—Bone Meal . .	I	3·7	4·4		Nil	20·6	21·5		21·5			
4/10/B Seaforth—National Growmore Fertiliser . .	I	7·0	7·1	5·0	5·8	2·0	2·5		8·3	7·0	8·9	
6/11/A Widnes—New Lawn Fertiliser . .	F	6·0	6·25	8·25	8·25	0·75	0·75		9·0	6·0	5·7	
7/11/A Widnes—Flower Fertiliser . .	F	7·0	6·7	6·5	6·5	0·5	0·85		7·35	10·5	10·2	
4/10/A Seaforth—No. 1 Topdressing 231 . .	F	10·8	11·0									
8/11/A Widnes—M.G. 6 P and T Fertiliser . .	F	7·0	6·7	6·0	5·65	1·0	1·50		7·15	9·0	8·9	
9/11/A Widnes—C.G. Granular Fertiliser	F	4·0	4·0	9·25	8·9	0·75	0·75		9·65	8·0	7·6	
3/3/B Kirkham—English Steamed Bone Flour . .	I	0·82	1·05					27·5	29·4			
4/3/B Kirkham—Nitro Chalk Fertiliser . .	I	15·5	15·4									C
10/11/A Widnes—Ground North African Phosphate . .	F				Nil	29·0	28·9		28·9			D
11/11/A Widnes—P.M.P. Powder Fertiliser . .	F		Nil	Nil	Nil	20·0	20·4		20·4	10·0	9·8	

G.—Guaranteed.

F.—Found

A.—Guaranteed, Calcium Carbonate 48·0 (CaO 26·9); Found, Calcium Carbonate 52·5 (CaO 29·4)

B.—Guaranteed, Organic Nitrogen 3·0; Found, Organic Nitrogen 3·23.

C.—Guaranteed, Calcium Carbonate 48·0 (CaO 26·9); Found Carbonate 48·2 (CaO 26·95).

D.—Guaranteed, Fineness through prescribed sieve 80·0; Found, Fineness through prescribed sieve 90·0.

Table 32.

Composition of Feeding Stuffs, 1954.

Sample Number, District and Description.	Formal or Informal.	Per cent. Oil.		Per cent. Albuminoids (Protein).		Per cent. Fibre.		Other Figures. per cent.
		G.	F.	G.	F.	G.	F.	
3/6/A Leyland— Fine Wheatfeed ...	F					9·0	7·5	...
4/6/A Leyland— Bran	F					11·0	11·6	...
5/7/A Bury— Cattle Ration	F	6·0	5·8	21·0	22·6	8·0	8·3	...
6/7/A Bury— Layers Mash with added vitamins	F	3·5	4·6	18·0	18·8	6·5	7·2	...
5/2/A Lonsdale— Pig Fattening Meal ...	F	2·5	2·7	13·0	11·3	6·0	5·3	...
6/2/A Lonsdale— Pig Meal for Sows and Weaners	F	4·0	3·8	15·0	15·6	6·0	4·5	...
5/6/A Leyland— Chick Mash	F	4·0	3·5	18·0	18·5	5·0	4·4	...
6/6/A Leyland— Growers Mash	F	3·5	3·1	16·8	15·8	5·8	4·9	...
3/10/A Seaforth— No 2 Pig Meal ...	F	3·0	3·7	14·0	14·3	5·8	5·1	...
7/2/A Lonsdale— Pig Fattening Meal ...	F	2·5	2·7	13·0	13·3	5·5	5·2	...
8/2/A Lonsdale— Pig Meal for Sows and Weaners	F	3·5	3·4	16·0	16·5	6·0	5·8	...
7/7/A Bury— Layers Mash with Added Vitamins ...	F	4·0	3·8	18·0	17·5	6·5	7·0	...
8/7/A Bury— Pig Meal No. 1 with Added Vitamins ...	F	4·0	3·4	17·0	18·3	5·5	4·1	...
5/10/A Seaforth— Pig Meal No. 2	F	3·0	2·9	14·0	13·9	6·0	4·6	...
6/10/A Seaforth— Layers Mash	F	4/1	3·7	17·2	16·2	6·0	5·3	...

Table 32—continued.

Sample Number, District and Description.	Formal or Informal	Per cent. Oil.		Per cent. Albuminoids (Protein).		Per cent. Fibre.		Other Figures. per cent.
		G.	F.	G.	F.	G.	F.	
5/10/B Seaforth Battery Pellets G and N	I	3·5	3·3	17·5	16·7	7·0	6·3	...
6/10/B Seaforth Superbalanced Dairy Meal, Coarse	I	4·0	4·2	20·0	19·3	9·0	10·8	...
5/4/A Lower Blackburn—Indian Meal ...	F						1·9	A
6/4/A Lower Blackburn—Milkier Milk Ration ...	F	4·0	4·2	19·0	19·0	8·0	9·7	...
7/10/A Seaforth—Superbalanced Dairy Meal, Coarse	F	4·0	4·3	20·0	22·0	9·0	12·1	...
8/10/A Seaforth—N.R. 15 Herring Meal ...	F	9·7	9·0	70·52	67·8			B
3/5/A Higher Blackburn—National Pig Food No. 2	F	3·25	3·0	14·25	14·0	6·0	5·4	...
4/5/A Higher Blackburn—Layers Mash	F	3·75	3·0	16·5	15·8	6·0	5·7	...
5/12/A Warrington—Pig Fattening Meal ...	F	3·0	2·9	14·5	14·5	6·0	5·5	...
6/12/A Warrington—Sow and Weaner Meal	F	3·5	3·3	17·5	16·1	6·0	5·5	...
7/6/A Leyland—No. 1 Pig Meal ...	F	3·2	4·4	17·5	16·9	4·4	5·1	...
8/6/A Leyland—Chick Starter Mash ...	F	4·0	3·9	18·0	17·7	5·0	4·5	...
5/3/A Kirkham—Laying Meal	F	4·5	4·3	17·5	16·0	6·5	5·1	...
6/3/A Kirkham—No. 2 Pig Meal ...	F	3·5	3·3	14·0	13·8	7·5	7·4	...
3/8/A Rochdale—H.Y. Meal	F	5·0	5·4	20·0	18·3	5·5	5·9	...
4/8/A Rochdale—Baconer Meal (Baconer with Antibiotic) ...	F	2·5	2·7	14·0	13·4	5·5	6·2	C
1/9/A Manchester—"—" Calf Pencils with Added Vitamins ...	F	5·5	5·7	24·0	22·1	6·5	5·9	D

Table 32—continued.

Sample Number, District and Description.	Formal or Informal	Per cent. Oil.		Per cent. Albuminoids (Protein).		Per cent. Fibre.		Other Figures. per cent.
		G.	F.	G.	F.	G.	F.	
9/10/A Seaforth—Grain Balancer Layers Mash	F	3·5	2·7	20·0	18·0	6·5	4·7	...
10/10/A Seaforth—Fattening Pig Meal ...	F	2·5	2·3	13·5	13·3	6·0	5·0	...

A.—Found, Ash 1·4 and Sand and Other Siliceous Matter Nil.

B.—Guaranteed, Salt (NaCl) 4·26 ; Found, Salt (NaCl) 4·2. Guaranteed, Phosphoric Acid (P_2O_5) 4·5 ; Found, Phosphoric Acid (P_2O_5) 4·4.

C.—Found, Antibiotic (as Aureomycin Hydrochloride) not less than 2·2 grams per ton.

D.—Found, Vitamin A Equivalent to 190,000 international units per 112 lbs. of the sample.

PART IV.—WATERS, EFFLUENTS, ETC.

Potable Waters.

Seventy-six samples of water have been examined during the year 1954 for suitability for drinking or domestic use. Of these thirty-three came from dairies. Five of the samples were examined for metallic contamination only and the remaining 71 which were submitted for full sanitary analysis, are classified in the following table according to their source and quality.

Table 33.

Waters, 1954.

Source.	Fit.	Doubtful.	Unfit.	Total.
Deep Well	9	0	0	9
Shallow Well	0	4	0	4
Upland Surface	36	4	0	40
Spring	6	6	1	13
Miscellaneous	2	3	0	5
Total	53	17	1	71

Forty-three of the samples in the above table were from public supplies (39 upland surface waters and four from deep wells). Three of these contained traces of nitrite. As this can result from chemical treatment of water or from the reduction of nitrates as well as from pollution, special consideration of the bacteriological findings was advised. All the other samples were of good quality.

Thirty-three of the 76 samples were submitted by the County Medical Officer of Health, the others being received from the following local authorities :—Boroughs of: Chorley, 6 ; Darwen, 10 ; Leigh, 5 ; Preston 3 ; Rawtenstall, 8 ; Morecambe and Heysham, 1 ; Fleetwood, 2 ; Rural Districts of : Garstang, 2 ; Lunesdale, 3 ; Wigan, 2 ; Urban District of Walton-le-Dale, 1.

Toxic Metals in Water.

Samples which had been in contact with lead, copper or zinc, either in service pipes or during subsequent storage, were examined for the presence of these metals.

Forty-one samples were examined for lead and the results are summarised in table 34.

Table 34.

Lead parts per million.	None Detected.	Less than 0·1.	0·1 to 0·3.	0·5.	0·9.
Number of Samples ...	31	6	2	1	1

Only two samples contained significant amounts of lead (the accepted upper limit being 0·3 part per million) with lead contents of 0·5 and 0·9 part per million respectively. Both were waters of an acid character and had been conveyed through lead pipes.

None of the 19 samples examined for copper contained a significant quantity of this metal.

Zinc was present in five of the 16 samples examined for it, but only one, which contained six parts per million of zinc, exceeded the usually accepted limit of five parts. A standard of as much as 15 parts per million, however, is accepted in at least one country.

Iron was found in seven of the 10 samples tested for it and three of these contained quantities in excess of the 0·4 part per million which is usually regarded as the upper limit above which complaints due to turbidity or staining may arise. The quantities found in these cases were 2·8, 3·4 and 26 parts per million, which rendered the untreated waters quite unfit for domestic use.

Other Waters, Effluents, etc.

Eight samples were examined under this heading.

Four effluents were examined ; one trade effluent for purposes of assessment under the Public Health (Drainage of Trade Premises) Act, 1937, two sewage effluents for compliance with the recommended standards of purity made by the Royal Commission on Sewage Disposal and one for comparison with a sample taken by the Lancashire Rivers Board. None of the three sewage effluents was satisfactory.

Two swimming bath waters from the same source gave evidence of the presence of unoxidised animal pollution. The first conformed with the Ministry of Health recommendations as far as pH (seven to eight) and free chlorine (0·2 to 0·5 part per million) were concerned but increased chlorine dosage had not resulted in complete oxidation of organic matter in the second sample. Recommendations were accordingly made for extra attention to the water processing during periods of heavy bathing.

Two samples of water were examined to assess their suitability for concrete mixing. The first was satisfactory and recommendations for neutralising excessive acidity in the second were made.

PART V.—MISCELLANEOUS SAMPLES.

This section of the report includes those samples which because of their nature or because of the circumstances under which they were obtained, could not be included in previous sections of the report. Two hundred and fifty samples were examined under this heading and they were submitted as follows :—County Medical Officer of Health, 9 ; County Education Officer, 4 ; Chief Officer, County Fire Brigade, 4 ; Rural District of Clitheroe, 1 ; Borough of Fleetwood, 2 ; Rural District of Garstang, 2 ; City of Lancaster, 67 ; Borough of Leigh, 70 ; Borough of Lytham St. Annes, 1 ; Borough of Morecambe and Heysham, 1 ; Urban District of Ormskirk, 1 ; County Borough of Preston, 77 ; Borough of Rawtenstall, 2 ; Urban District of Tyldesley, 1 ; Urban District of Walton-le-Dale, 1 ; Rural District of West Lancashire, 2 ; five samples were also examined for the information of the laboratory. The work carried out on some of the more interesting of these samples is discussed briefly in the following paragraphs.

Atmospheric Pollution.

During the year 1954, work was continued on the measurement of atmospheric contamination for the County Borough of Preston and the Borough of Leigh. This section of the Laboratory's work increased in February when the City of Lancaster set up three measuring sites in their area resulting in the analyses during the year under review of a total of 102 deposits from soot gauges and 105 lead peroxide candles from the nine sites operated by the three Authorities.

The results from these observations as well as being of local interest are also used as part of a nation-wide investigation by the Department of Scientific and Industrial Research to study any long term changes in atmospheric pollution and their possible effects on Public Health problems.

The standard soot deposit gauge consists of a large glass funnel of known area leading into a bottle large enough to hold a month's rainwater. The soot and water collected are brought into the laboratory at the end of each month for analysis, the determinations carried out being those listed in table 35. The sulphur candles are porcelain cylinders of known area which are covered with a layer of lead peroxide prepared under standard conditions. This surface, on exposure at the site, reacts chemically with sulphur gases present in the surrounding atmosphere and when it is examined at the end of the month its sulphate content is proportional to the average concentration of corrosive sulphur gases in the air at that point for the whole of the month. This information is important as it is an indication of the effect of the polluted atmosphere on paintwork, metals, curtains, etc. It should be noted that, even if visible smoke and grit emission from chimneys are prohibited and smokeless zones become more common, sulphur gases will still be released into the atmosphere whenever coal or smokeless solid fuel is burned and it is these invisible gases which cause such damage to man, property and vegetation.

The seasonal variation for insoluble solids (soot) and active sulphur for the three sites in the Borough of Leigh are shown graphically in figures I and II. It will be seen that the amount of atmospheric contamination, as measured by gauge or candle, varies quite a lot from month to month being affected by such factors as direction and strength of the wind, temperature, season, rainfall, etc. The results from five or more years observations have to be patiently gathered together, therefore, before these seasonal variations can be allowed for and conclusions reached regarding the significance of any increase or decrease in pollution.

Since the prevailing wind is from the West, most information is obtained in atmospheric pollution investigations by selecting the measuring sites so that one is on the outskirts to the West, one in the centre and the third on the East side of the area under investigation. For example, in the Borough of Leigh the sites chosen with this in view are, going from West to East, the Firs Maternity Home, the Town Hall and the Grammar School, respectively. The average results for the fifth complete year are given in the tables below. The soot gauge figures show very little change from those obtained in previous years but the sulphur dioxide figures show significant increases of 18 per cent., 22 per cent. and 13 per cent. respectively over the averages of the previous four years. These increases are due to the unusually high figures obtained from all the sites during the first three months of the year.

Table 35.

Soot Gauge Observations, 1954.

Monthly Averages in Tons per Square Mile.

Borough of Leigh						
Site.	Firs Maternity Home.		Town Hall.		Grammar School.	
Rainfall in inches ...	3·82		3·72		3·92	
Tar	0·10	10·65†	0·24	18·35†	0·08	8·94†
Carbonaceous matter other than Tar ...	4·14		6·39		2·86	
Ash	6·41		11·72		6·00	
Soluble Deposit ...	8·06		10·41		9·95	
Total Deposit	18·71		28·76		18·89	
‡Sulphate as SO4 ...	2·52		3·13		3·19	
‡Chloride as Cl ...	2·23		2·59		2·38	
‡Calcium as Ca	0·38		0·55		0·43	
pH	4·2		4·3		4·1	

† Insoluble Deposit.

‡ Included in soluble deposit.

In three instances where monthly results were not available estimated values have been used.

Table 36.

Estimation of Active Sulphur by Lead Peroxide Method, 1954.

Milligrams of Sulphur Trioxide per 100 sq. cms. Batch "A" Lead Peroxide in Louvered Cover.

Borough of Leigh			
Site.	Firs Maternity Home.	Town Hall.	Grammar School.
Daily Averages	2·23	2·85	2·19

BOROUGH OF LEIGH, 1954

FIG. I.

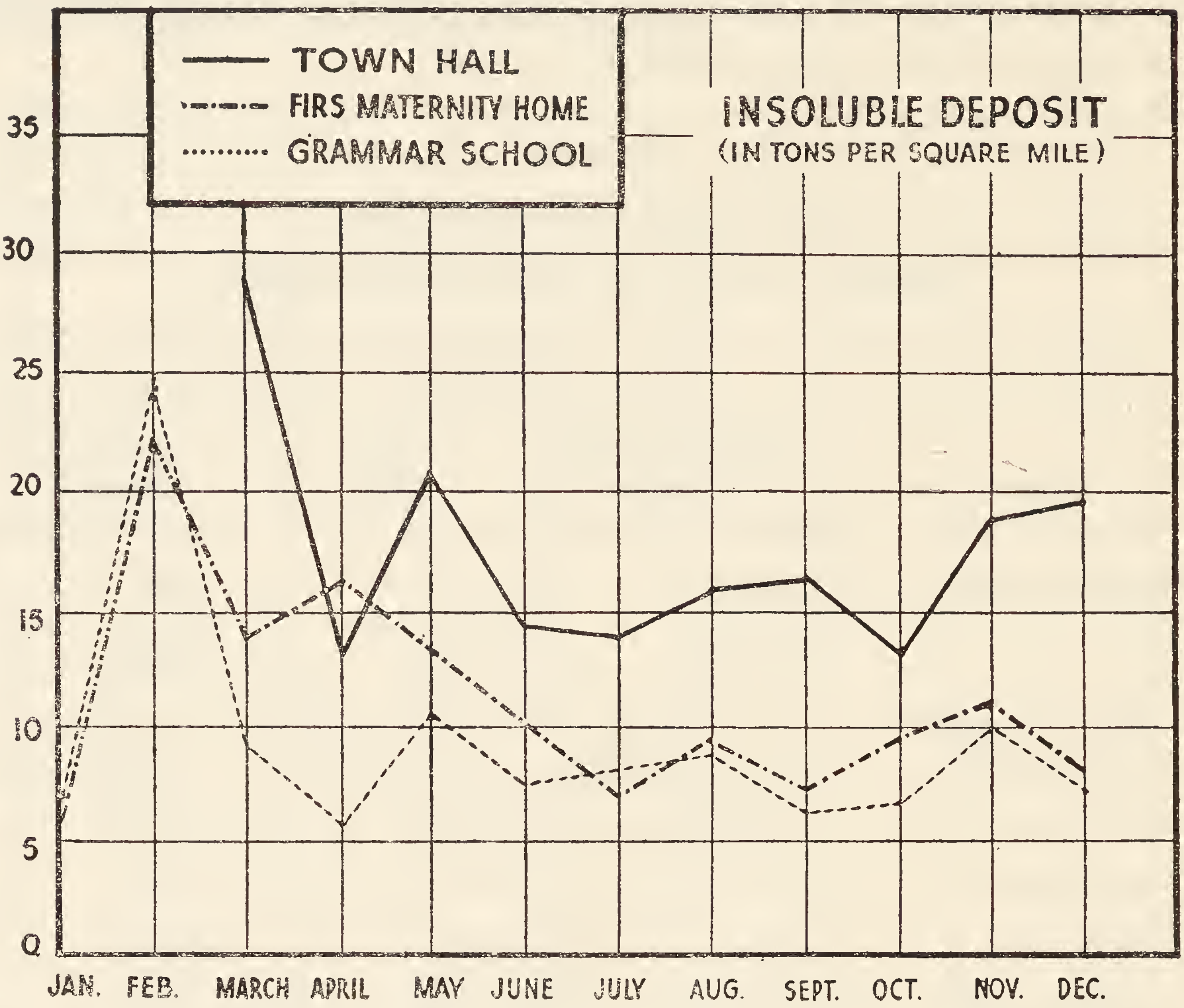
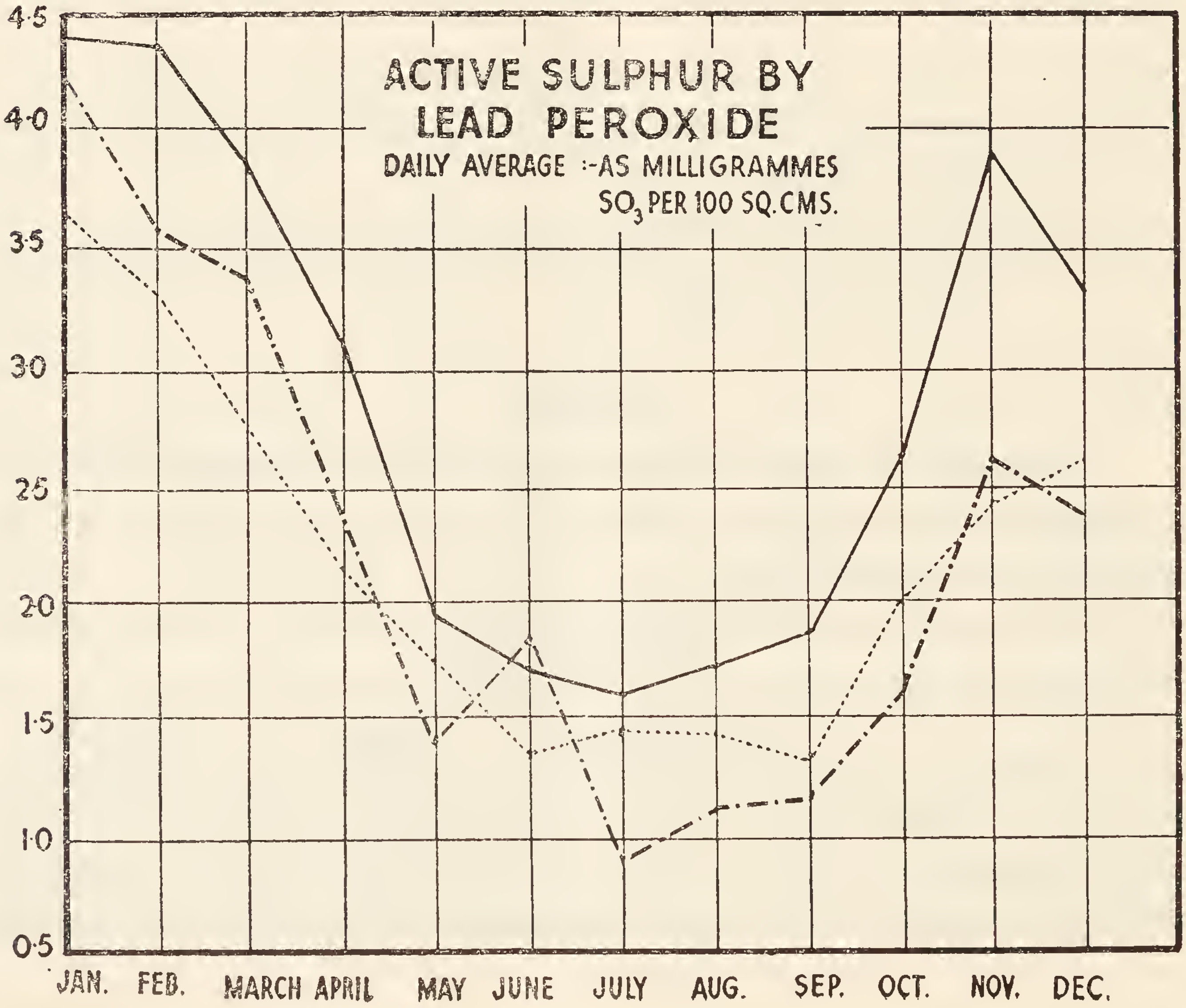


FIG. II.



Shrimps, Canned, Sample No. M.6438.

This informal sample of canned foreign shrimps was submitted by the Chief Sanitary Inspector of a Borough in the County following an enquiry by a dealer as to whether it would be permissible to import them for re-sale in this country. It is interesting to note that, although the shrimps were canned and were labelled as being free from boron, they did, sn fact, contain benzoic acid equivalent to 1,900 parts per million parts of the sample and hexamethylenetetramine equivalent to 215 parts per million of formaldehyde. The Public Health (Preservatives, etc., in Food) Regulations, 1925 to 1953 do not permit the presence of any preservative in fish nor is formaldehyde permitted to be added to food of any description in this country. The sale of this commodity would, therefore, have been illegal.

Fish Box, Sample No. M.6437.

A fish box was submitted by the Chief Sanitary Inspector of a Borough in the County because of considerable deep blue staining on the exterior of the box which in places had penetrated to the interior and slightly stained the contents which consisted of fresh salmon. It was noted that the staining was most pronounced in the vicinity of the iron bands which surrounded the box. The wood of the box was found to be oak and shavings of the clean wood gave an identical deep blue colouration when immersed in a dilute solution of an iron salt. There is little doubt that iron derived from the corrosion of the metal bands through contact with water had formed an " ink " with soluble tannins derived from the wood. This was confirmed in that the iron content of the stained wood (calculated on the dried wood) was 1·43 per cent. while that of the clean unstained wood was only 0·006 per cent.

Cod Fillets, Sample No. M.6487.

A box of cod fillets was also received from the same Inspector as the previous sample for identification of the cause of a taint which had resulted in complaints being made as to the quality of the fish. The fish when received had an unusual odour resembling that of tar oil or phenolic disinfectant, although no visible signs of contamination were found. A representative portion of the sample was examined for phenolic substances and these were, in fact, found to be present to the extent of 10·5 parts (calculated as phenol) per million parts of the sample. A sample of the crushed ice used for packing fish and two samples of untainted cod fillets from other sources when similarly examined were found to be free from phenolic substances. This result emphasis the desirability of keeping fish and other foods away from substances such as phenolic disinfectants which can give rise to taint.

Butter, Samples No's M.6318 and M.6319.

These samples were submitted by the Sanitary Inspector of a County District as the result of a complaint. The first was handed to the Inspector by the complainant and the second was taken from the remainder of the same purchase which had been placed in the complainant's butter dish. In both samples, but particularly in the latter, it was possible to see that the material was not homogeneous but both types of fat present were coloured yellow. The samples gave the following results upon analysis :—

	M.6318	M.6319
Butter fat	3·2	66·7
Other Edible fat	92·1	18·9
Water	3·8	12·2
Curd, Salt, etc.	0·9	2·2
	100·0	100·0

These results confirmed the presence of two types of fat and the low figures for moisture and for curd and salt, together with the taste and yellow colours of the fats, indicated that the samples were mixtures of butter and pastry margarine rather than ordinary domestic margarine. It transpired that the retailer in question had purchased his butter in loose bulk from a wholesaler and it is probable that the latter had accidentally made up the weight required with pastry margarine instead of butter.

Meat, Samples No's M.6346 and M.6347.

These two samples of raw meat were submitted by the Chief Sanitary Inspector of a County District for examination for the presence of horse flesh. An examination of the extracted blood serum from the samples by the serological or precipitin test showed, however, that the meat consisted of bovine flesh and not horse flesh. The fat attached to the lean meat also gave constants which were consistent with those of beef fat and not of horse fat.

Milk, Samples No's M.6369 to M.6372 inclusive.

In the report for the year 1953 some analytical results were given for milk which had passed through an H.T.S.T. pasteurising plant which emphasised the importance of discarding sufficient of the first run milk in order to prevent extraneous water gaining access to the bottled milk.

If this and other precautions are not taken extraneous water may find its way into the milk following the use of water for cleaning or for the preliminary heating up of the plant. A further series of samples were taken during the year under review from another H.T.S.T. pasteurising plant and these also showed the presence of extraneous water in the first run milk but not to the same extent as was found in the samples examined in the previous year. Sample No. M.6369 was taken immediately after five gallons of first run milk had been discarded and this showed the presence of 4·8 per cent. extraneous water. A mixed sample (No. M.6370) from the next 10 gallons showed 2·6 per cent. extraneous water. The two remaining samples were taken after 15 and 30 gallons of milk respectively had passed through the plant and both of these were found to be free from extraneous water.

Sample No.	Fat %	Solids-not-fat %	Freezing Point (Hortvet) °C.	Percentage Extraneous Water.
M.6369 ...	3·10	8·10	—0·501	4·8
M.6370 ...	3·25	8·40	–0·514	2·6
M.6371 ...	3·45	8·70	–0·535	—
M.6372 ...	3·45	8·65	–0·533	—

Milk, Sample No. M.6486.

This sample of bottled tuberculin tested milk was submitted on account of its unusual appearance by the Medical Officer of Health of a County District. The sample when received had a faintly putrid odour, a deep layer of thickened cream, an unusual brownish-yellow colour and it gave the following results upon analysis :—Fat, 7·8 per cent., solids-not-fat, 7·7 per cent., freezing point (Hortvet) –0.576°C., protein 4·0 per cent., ash 0·90 per cent., chloride 0·21 per cent., acidity (as lactic acid) 0·15 per cent. and sediment (animal cells, etc.) 230 parts per million. The sample was free from preservatives, detergents and artificial colouring matter and its appearance and abnormal composition were probably due to a pathological condition of the udder such as mastitis.

Grapefruit, Canned. Sample No. M.6393.

This sample consisted of an opened and an unopened can of grapefruit submitted on complaint that they contained yellowish-white specks on the fruit and floating in the syrup. The contents of both cans were found to contain a number of these specks which, upon examination, were found to consist of clusters of microscopic needle-shaped crystals having an intensely bitter taste and which were soluble in hot water and in chloroform. These properties are characteristic of the glucoside naringin which is found naturally in the pith and, to a lesser extent, in the juice of grapefruit. Although even more bitter than quinine the glucoside is not harmful but may crystallise out, as in the case of this sample, particularly if stored under cold conditions.

Lemon Cheese, Sample No. M.6416.

This sample which had been made in a copper boiling pan at a School Meals Kitchen was slightly brown in appearance and a query had been raised as to whether any contamination had occurred. The sample was found to be free from significant amounts of toxic metals, including copper, but it yielded the following figures upon analysis :—

Moisture	23·3
Fat	22·6
Sugars, etc.	49·8
Citric Acid	0·8
Fat free egg solids... ...	3·5
	100·0

Commercial samples of lemon cheese usually contain a much lower proportion of fat, varying from the minimum standard of four per cent. to about 13 per cent. The high proportion of fat and the corresponding low amount of moisture in this sample had probably been contributory causes to the commodity being slightly overheated locally during preparation which would result in some discolouration.

Tea, Sample No. M.6471.

This sample was submitted by the Medical Officer of Health of a County District because it was suggested that the chest of tea from which it had been taken had been broken in transit and accidentally contaminated with powdered Steatite. This mineral, also called Soapstone, is a type of talc or magnesium silicate. Upon analysis it was found that the sample did, in fact, contain 1·45 per cent. of mineral matter of the nature of talc. A trial test carried out on the sample showed that the talc, which was finely powdered, could be almost completely removed from the tea by sieving and this was suggested as a possible method of salvaging the remainder of the stock.

Metal Drink Dispenser, Sample No. M.6463.

A bottle of orange squash, most of the contents of which had been used, bearing inserted in the neck by means of a cork a metal drink dispenser, was submitted on complaint of causing sickness. It was seen that both on the inner tube of the dispenser and on the cork there was a green deposit which was found to consist of copper salts. There were metallic fragments in the orange squash itself which were found to be fragments of nickel plating. The dispenser itself upon examination was found to be made of brass which had been thinly plated with nickel. The one and a half fluid ounces of orange squash remaining in the bottle had a very unpleasant and astringent taste and contained soluble copper to the extent of 390 parts per million and soluble zinc to the extent of 380 parts per million. These amounts of copper and zinc are greatly in excess of the normal maximum limits for foods of 20 parts per million and 50 parts per million respectively recommended in reports by the Metallic Contamination Sub-Committee of the Food Standards Committee of the Ministry of Food. Furthermore, although contamination of foods by traces of copper and zinc is not regarded as seriously as contamination by lead, never-the-less, soluble salts of both the former metals act as emetics, and may do so in foods if present to the extent of several hundred parts per million. The metal drink dispenser in question was of foreign make and there is no doubt that its use had rendered the orange squash unfit for human consumption. This dispenser was quite unsuitable for use in contact with acid liquids such as orange squash. The facts in relation to this sample were brought to the notice of the Medical Officer of Health for the area in which the dispenser had been purchased and, as a result, the remaining stock of the dispensers was withdrawn from sale and returned to the importers.

Anti-freeze Compounds, Samples No's M.6368, M.6436, M.6464 and M.6506.

The above samples were submitted by the Chief Officer, County Fire Brigade, in order to check their suitability for use in the cooling systems of motor vehicles. Three points were considered in examining the samples : (*a*) a determination was made of the degree of frost protection afforded when used according to the makers' instructions, (*b*) tests were carried out to ascertain whether there was any diminution in the protection afforded after the material had been in use for some time and (*c*) the compounds were examined for any corrosion effect on aluminium. In the case of the first two samples, which consisted of a mixture of approximately three parts of alcohol to one of ethylene glycol, it was possible to show that while the protection afforded when the material was first introduced into the cooling system of a motor vehicle agreed with that claimed by the makers there was, however, some loss of alcohol and a corresponding diminution in frost protection after the material had been in use some time even in a closed circuit cooling system. The remaining two samples consisted of pure ethylene glycol with a stabiliser and solutions of these, as was to be expected, showed no significant difference in their freezing points even after heating on a boiling water bath in an open container for several hours.

In addition to the above, mention should be made of the following examinations also carried out in connection with central purchasing. A determination of the relative water absorbing powers of two makes of dental throat packs was carried out for the County Medical Officer of Health and two samples of liquid synthetic detergent and two of carbolic soap were examined for the County Education Officer. The synthetic detergents were compared with the requirements laid down in the appropriate specification while the carbolic soaps were submitted in connection with a complaint alleging the presence of excess alkali. Both of the latter samples were shown to be within the requirements of the British Standards Institution Specification in regard to both total free alkali and free caustic alkali.